The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXI, No. 13.—PART 1 CHICAGO, ILLINOIS SEPTEMBER 27, 1913

OZONE: ITS BACTERICIDAL, PHYSIOLOGIC AND DEODORIZING ACTION *

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THE BACTERICIDAL ACTION OF OZONE

The use of ozone as a gaseous disinfectant has often been advocated, but the claims made for its efficiency have little or no experimental basis. [Review of earlier investigation omitted.]

Our own experiments have been carried out (1) to determine the germicidal action of ozone on pure cultures under the conditions commonly used in testing disinfectants, and (2) to determine the effect of ozone on the ordinary air bacteria.

All experiments were carried out in a small room of about 26 cubic meters. There was one door and one window in the room. In the first experiment there was ventilation to the room through a 3-inch hole in the window. In the remaining experiments there was no ventilation, the air being worked over and over.

The ozone generator described later was placed at one side of the room about 4 feet from the floor, and was run at high speed throughout the experiments.

Analysis of the products coming direct from the ozonator showed no oxids of nitrogen present in 10 liters (quarts) of the air.

An analysis was made of the products coming direct from the machine while running at the two different speeds. Speed 1 showed a concentration of 3.5 parts of ozone per million; speed 2 showed a concentration of 8.9 parts of ozone per million.

Staphylococcus pyogenes aureus and *Bacillus pyocyaneus* were the organisms used in each experiment, being taken in each case from a twenty-four-hour broth-culture. Equal parts of litmus milk and peptone broth were used in determining the growth of the organisms after exposure.

EXPERIMENTS

EXPERIMENT 1.—Sterile cotton threads 1 inch in length were immersed in twenty-four-hour broth-cultures and then placed in envelopes. One-half the number of threads were allowed to dry for two hours at ordinary room temperature before exposure, while the other half were exposed in a moist condition. Small pieces of each thread were retained and used as controls. No inhibitory effects were visible. [Table 1 omitted.]

EXPERIMENT 2.—The organisms were exposed for periods of one and one-half hours, three hours and four and one-half hours, respectively. Only moist bacteria were used. They were exposed in Petri dishes on strips of filter-paper immersed in the twenty-four-hour broth-culture. No inhibitory effects could be seen in any of the exposures. [Table 2 omitted.]

EXPERIMENT 3.—The organisms were exposed in both dry and moist condition, on threads in envelopes and on filter-paper in Petri dishes. The first twenty-four of these experiments or tests were carried out on filter-paper. Part of the organisms exposed were dried in an incubator at 37.5 C. (99.5 F.). The last twenty-four of these experiments were carried on similarly to the first half, but with threads in envelopes. [Table 3 omitted.]

All tests in this experiment showed no effects of the ozone. No difference could be detected between the growth of those organisms at the highest concentration of ozone after long exposure, and those exposed for the short period and at the lower concentration.

EXPERIMENT 4.—Small pieces of sterile filter-paper were immersed in the broth-cultures and half of them allowed to dry for two hours in an incubator at 36.7 C. (98.06 F.). At the end of two hours small pieces were retained as controls, while both moist and dry strips of paper were exposed to the ozonator products in small cheese-cloth sacs for varying periods of time and in different positions.

The only difference in this experiment from those preceding is that *B. pyocyaneus*, dry, showed no growth after twenty-four hours of incubation at 37 C. (98.6 F.). At forty-eight hours, however, there existed no difference between this culture and the others. [Table 4 omitted.]

EXPERIMENT 5.—The organisms were exposed in the cheese-cloth sacs as in Experiment 4. The results were practically the same as in the preceding experiment.

Those organisms exposed for the longest time were placed in the position in which the concentration of the ozone was 8.9 parts per million, and here no inhibitory effects could be detected. [Table 5 omitted.]

EXPERIMENT 6.—Only moist bacteria were exposed on filter-paper for a period of three hours.* An analysis was made after two hours of the ozone coming ino the room, and 4.06 parts per million were found, while at three hours there were 4.5 parts present. [Table 6 omitted.]

EXPERIMENT 7.—Agar and gelatin plates were exposed to the ozone; some of the plates were streaked with *B. coli* and *B. pyocyaneus* both before and after exposure. The experiment was carried out under the same conditions as the preceding experiments and the exposure was for five hours. The machine was run at the highest speed and the concentration of ozone determined after two hours and after five hours. After two hours' running the concentration was found to be 3.6 parts per million and after five hours, 4.8 parts per million. All the plates exposed were directly in front of the exhaust and as close as possible to the machine. The following showed good growth:

Agar exposed and streaked with *B. coli* afterward.
Agar unexposed and streaked with *B. coli*.

Agar exposed and streaked with *B. pyocyaneus* afterward
Agar unexposed and streaked with *B. pyocyaneus*.
Agar streaked with *B. pyocyaneus* and then exposed.

* This investigation was carried on at the suggestion of, and under a grant from, THE JOURNAL of the American Medical Association.

* Tabular matter, certain details of investigation, etc., are here omitted. The article will appear in full in a pamphlet, a copy of which may be had by sending stamped, directed envelope to this office.

Gelatin exposed, then streaked with *B. pyocyaneus*.
Gelatin unexposed and streaked with *B. pyocyaneus*.
Gelatin streaked with *B. pyocyaneus* and then exposed.

One day later good growths developed in the following tubes:

Gelatin exposed, then streaked with *B. coli*.
Gelatin unexposed and streaked with *B. coli*.
Gelatin streaked with *B. coli* and then exposed.

EFFECTS OF OZONE ON AIR BACTERIA

In the following experiments the conditions were the same as in the preceding experiments. The dust in the experimenting-room was stirred up by the use of a rag; the room was then closed for fifteen minutes to allow the dust to become evenly mixed with the air. At the end of this period four sterile agar plates were exposed for a period of twenty-five minutes, at the end of which the plates were collected from the various points in the room where they were exposed and incubated for twenty-four hours at 37 C. (98.6 F.). At the end of the twenty-five-minute period the electric fan in the ozonator was allowed to run for one hour, after which four more agar plates were exposed in various places for the original period of twenty-five minutes. At the expiration of this period the plates were collected and incubated for twenty-four hours at 37 C. This experiment was carried out in the morning. The room was left alone until the same afternoon, at which time the dust was stirred up as in the morning and then left for fifteen minutes. Then the same experiment was carried out as in the morning with the exception of the running of the electric fan, in place of which the ozonator was allowed to run at Speed 2 as in the previous experiments. Twenty-four hours later the colonies on the plates were counted. The results were as follows:

EXPERIMENT 8.—Four plates were exposed for twenty-five minutes.

Exposure	Colonies
Before running of fan	38
After running of fan	56
Before running ozonator	64
After running ozonator	38

EXPERIMENT 9.—Four plates were exposed for twenty-five minutes.

Exposure	Colonies
Before running of fan	28
After running of fan	23
Before ruaning ozonator	49
After running ozonator	18

EXPERIMENT 10.—This experiment was carried out in the same room and with the same machine as the preceding experiments. Five agar plates were exposed to the air at various points in the room for a period of thirty minutes before and after the running of the electric fan and the ozonator. The number of colonies before running the fan was fifty-eight; after running the fan, seventy-three.

Plates were now exposed at the same points and then the ozonator, instead of the electric fan, was allowed to run for an hour. The number of colonies before running the ozonator was sixty-one; after running the ozonator, sixty-seven.

EXPERIMENT 11.—This experiment was carried out as Experiment 10 with the exception that the dust was stirred up in the room thirty minutes before exposure of the plates before running the ozonator and the fan. The number of colonies before running the fan was seventy-one; after running the fan, fifty-seven. The number of colonies before running the ozonator was seventy-eight; after running the ozonator, thirty-four.

The results of these experiments show that:

1. No surely germicidal action on certain species of bacteria could be demonstrated by the usual disinfection tests with amounts of gaseous ozone ranging from 3 to 4.6 parts per million.

2. The alleged effect of ozone on the ordinary air bacteria, if it occurs at all, is slight and irregular even when amounts of ozone far beyond the limit of human physiologic tolerance are employed.[6]

[Review of early investigations omitted.]

The most recent contribution to the physiology of ozone is that of Hill and Flack.[7] These investigators failed to obtain any evidence that ozone in small concentrations stimulates the respiratory metabolism, but they confirm Bohr and Maar in finding that any considerable concentration (even less than 1 per million) of ozone diminishes the oxygen intake and the carbon dioxid output. This was established for mice, rats and man. Exposure of ten minutes to ozone in concentrations of 1 part to five millions may lower the rectal temperature of rats as much as 3 degrees.

Hill and Flack also observed the depression and coma following the initial restlessness on breathing strong concentrations of ozone (from 2 to 20 parts per million of air).

THE OZONE GENERATOR

The ozone in our experiments was produced by the "Ozonator" manufactured by the General Electric Company, the type for the direct current. The company states that this machine gives a flow of ozonized air of about 4,250 cubic feet per hour. The machine is made to deliver ozonized air in two different concentrations, designated as 1 and 2. The change from 1 to 2 is made by simply turning a key.

The method of Baumert as modified by Hill and Flack was used for determining the ozone concentration. Ten liters of ozonized air were drawn through a bottle containing 50 c.c. of 1 per cent. solution of potassium iodid acidified by 5 c.c. of 10 per cent. solution of sulphuric acid, 1 c.c. of 1 per cent. solution of boiled starch added, and titrated with the hyposulphite solution. The hyposulphite solution was made up to contain 0.222 gm. per liter, so that 1 c.c. of the solution represented 1 part of ozone per million parts of air when 10-liter air samples were used.

Tests of the air coming directly from the machine yielded the following results: Concentration 1, from 4 to 5 parts of ozone per million parts of air. Concentration 2, from 10 to 11 parts of ozone per million parts of air. After five weeks' more or less constant use each day the machine yielded a somewhat lower ozone concentration.

Tests for the oxids of nitrogen in the ozonized air were made after the machine had been in use five weeks, with negative results.

THE INFLUENCE OF STRONG CONCENTRATIONS OF OZONE ON MAMMALS

These results simply confirm the findings of previous observers. Ozone in any considerable concentration is an intense irritant to the respiratory tract and other mucous membranes, and causes illness and death from edema of the lungs.

THE RATE OF DECOMPOSITION OF OZONE BY THE MUCOUS MEMBRANES OF THE NOSE AND THE PHARYNX

In three dogs and two rabbits tracheotomy was performed under ether, a tracheal cannula inserted well below the larynx, the wound treated with cocain, and

6. After the work recorded in this paper was practically completed an article by Konrich appeared, Zur Verwendung der Ozone in der Lüftung, Ztschr. f. Hyg., 1913, lxxiii, 443. The results of this observer are essentially similar to our own.

7. Hill and Flack: Proc. Roy. Soc., 1911, lxxxii, 404; Jour. Roy. Soc. Arts, 1912, lx, 344.

the animals allowed to recover from the ether anesthesia. In these animals the ozonized air entered the trachea directly, and no air entered the nose and larynx. When these animals were exposed to ozone in concentrations of 10 parts to one million parts of air, the irritation and edema of the trachea and the lungs developed much sooner than in the animals breathing through the nose—on the whole about four times faster. It thus takes only about thirty minutes' exposure to develop the degree of hyperemia and edema of the bronchi and the lungs produced by a two hours' exposure in the animal breathing through the nose. Evidently at least three-fourths of the ozone in the inspired air is decomposed by the mucous membrane of the upper end of the respiratory passages. The strength of ozone in the inspired air is therefore no measure of the concentration of ozone that comes in contact with the alveolar epithelium. This rapid destruction of the ozone by the mucous membrane of the upper end of the respiratory passages acts, of course, as a protecting mechanism for the lung tissue.

Our results on this point find corroboration, indirectly, in the observations of Hill and Flack that there is no demonstrable amount of ozone in the expired air when one is breathing an air-ozone mixture.

THE INFLUENCE OF OZONE IN THE INSPIRED AIR ON THE HEART AND THE BLOOD-PRESSURE IN THE DOG

As already pointed out, a stage of depression and drowsiness or coma due to breathing ozone in strong concentrations has been noted by many observers. Binz went so far as to assert that ozone was a sleep-producing gas. The depression or coma was very evident in our animals. And during this work with the animals one of us (A. J. C.) unavoidably breathed ozone in varying concentrations for short periods. If the ozone concentration was fairly strong, or if the weaker ozone concentrations were respired for longer periods, drowsiness and headache invariably followed.

It is quite evident that the ozone in the respired air does not reach the blood-stream. What, then, is the cause of the headache and the depression or drowsiness? These symptoms may be due to:

1. Depression of the tissue metabolism in consequence of the depression of the gaseous exchange in the lungs, as shown by the investigations of Bohr and Maar and of Hill and Flack.

2. Reflex effects on the central nervous system from the irritation of afferent nerve endings in the respiratory passages.

3. Cardiac and vasomotor changes due to *(a)* the stimulation of nerve endings in the respiratory tract, or (*b*) the altered metabolism of the tissues.

So far as we are aware the cardiac and vasomotor changes on exposure to ozone have not been extensively studied. Our method of procedure was as follows:

[Description of method omitted.]

When the animal breathes in the normal way through the nose, the ozonized air always causes a primary acceleration of the heart and an increase in the amplitude of the pulse. There is usually not very marked change in the carotid blood-pressure during this first phase. The changes in the heart activity have been observed *pari passu* with a lowered as well as with an increased blood-pressure. If the exposure to the ozone is continued for from thirty to sixty minutes, the strength of the heart-beat gradually fails and there is a corresponding gradual fall of the carotid blood-pressure. A typical tracking showing these changes at the beginning of an ozone period is given in Figure 1. The final weakening of the heart and lowering of the blood-pressure is illustrated in Figure 2.*

In one case we were fortunate in securing record of the heart-beat and the blood-pressure during what seems to be a period of Cheyne-Stokes respiration. This came on ten minutes after the cessation of a thirty-minute breathing (tracheal tube) of ozone in the concentration of 10 parts to one million parts of air. The somewhat labored and irregular respiration stopped abruptly, and we thought that the animal was about to die from respiratory failure, but we decided not to resort to artificial respiration so long as the heart was in fair condition. After a respiratory standstill for four and one-half minutes, five fairly strong respiratory movements were made spontaneously, and then followed a second standstill for two minutes, and again two respiratory movements followed by a third period of standstill lasting for one minute. After this third period the respiratory movements persisted with fair regularity. The blood-pressure record is reproduced in Figure 3.*

The slowing and weakening of the heart at the beginning of the first and longest period of respiratory standstill is in all probability due to vagi action (stimulation of the medullary centers by the increased carbon dioxid in the blood). The apparent recovery of the heart strength before the reappearance of the respiration is probably due to the initial stimulating action of increased carbon dioxid on the heart tissues directly, as shown by Henderson and by Starling. This condition of the heart persists despite the two brief periods of respiratory movements, because these were not sufficient to remove the excess of carbon dioxid, especially as activity of the lung tissue was greatly depressed by the ozone. The rapid and temporary rise of the carotid blood-pressure simultaneously with the respiratory period must be due to some association between the respiratory and the vasoconstrictor centers in the medulla.

When these striking changes in the heart and the respiration appeared, the dog was already in a state of marked depression or coma. There can be no question that the feeble heart-beat and low blood-pressure noted after prolonged exposure to strong ozone concentrations are factors in the depression or coma following the ozone breathing; but these changes are also accompanied by irritation, depression and edema of the respiratory tract. The drowsiness and headache produced by ozone in man certainly appear long before there is any marked edema of the respiratory tract, weakening of the heart, or persistent lowering of the blood-pressure. The cardiac and vasomotor changes that are seen in dogs at the beginning of the ozone exposure do not seem sufficient to cause drowsiness or headache. In order to settle this point more definitely the following experiments were made on man.

THE INFLUENCE OF BREATHING OZONE ON THE HEART AND THE VASOMOTOR MECHANISM IN MAN

Three men (A. J. C., F. H. M., W. A. S.) served as subjects in these tests. The blood-pressures were recorded by the Erlanger sphygmomanometer, the cuff being adjusted to the left arm. The subject sat a few inches away from and facing the ozonator, so that the respired air contained the full concentration of ozone

* Figures omitted here are included in reprints.

as it came from the machine (5 parts and 10 parts per million, respectively). The results were uniform and practically without exception. The respiration of ozone caused an increase in the amplitude of the heart-beat, without any appreciable or constant change in the rate of the beats or in the blood-pressure. It is to be noted, however, that the exposure to the ozone was of brief duration, that is, only long enough to complete a test. Typical records obtained by the sphygmomanometer under these conditions are reproduced in Figure 4.

The exposure to ozone during these tests was sufficient to cause drowsiness and headache. One of the subjects actually fell asleep during one test. This happened to be a test with the plethysmograph, but there was no vasodilatation of the arm similar to that of normal sleep. Possibly the sleep was too brief and too light for this reaction to appear. It does not seem to us that the cardiac and vasomotor changes revealed by these tests are sufficiently great to account for the drowsiness and the headache.

The ozone headache may come on during or shortly after a brief exposure to ozone in greater dilutions; in some cases it comes on two or three hours after the exposure. If the ozone exposure has been rather marked the headache may persist for from two to six hours. According to our experience, it is always a frontal headache, similar to that in the case of "head-cold." We believe that this headache is due to irritation and consequent hyperemia of the frontal sinuses by the ozone. This view is supported by the fact that such hyperemia of the sinuses is actually present in dogs after exposure to ozone.

In this connection we may note that the breathing of ozone in concentrations up to 10 parts per million for short periods not exceeding a total of fifteen minutes produces "sore throat" that persists for two or three days. The "sore throat" is occasionally accompanied by some pain in the chest. These conditions are evidently due to the corrosion of the mucous membrane by the ozone.

One of the subjects (W. A. S.) had "sore throat" ("cold") at the beginning of these experiments. We had here an opportunity to see whether or not the inhalation of ozone in the greatest concentration that may be used with safety for a short period will check the bacterial invasion of the throat either by directly killing the bacteria or by producing hyperemia through the irritation, as suggested by Hill and Flack. The daily exposure to the ozone not only did not improve, but actually aggravated the sore throat. It is not improbable that the impairment of the cells of the mucous membrane by the corrosive action of ozone renders the cells less resistant to bacterial invasion.

CAUSE OF THE DROWSINESS, DEPRESSION AND COMA FOLLOWING EXPOSURE TO OZONE

We have seen that the cardiac and vasomotor changes are probably not important factors. There remains then to consider the part played by direct depression of the nervous system from stimulation of the nerve endings in the respiratory tract, by the absorption of toxic substances from the cells of the respiratory tract injured by the ozone, or by the lowered metabolism of the tissues following the diminution of the gaseous exchange in the lungs.

It would seem that, if the afferent impulses play an important part in the depression and coma, these effects ought to be influenced by tracheotomy and section of both vagi. When the animal breathes through a tube inserted well below the larynx, the irritation of the upper end of the respiratory tract by the ozone is eliminated. Section of both vagi cuts off (at least in the main) the nervous impulses from the lungs and the bronchi.

A number of tests were made on dogs and rabbits thus prepared. The changes in the respiratory movements following double vagotomy, especially in dogs, are disturbing factors. Our results showed that animals with both vagi cut succumb more quickly from ozone than the animals with the vagi intact, but the depression and coma are not apparent until a degree of lung injury is reached from which the animals do not recover. When the vagi are intact the animals may recover completely from exposures to ozone sufficient to cause marked depression.

It would therefore seem that the afferent nervous impulses due to the irritation of the respiratory tract by the ozone contributes to the ozone depression and coma, but that the changes in the metabolism, and possibly in the composition of the blood, are by themselves capable of causing depression, especially after prolonged ozone exposure.

THE INFLUENCE OF WEAK CONCENTRATIONS OF OZONE BREATHED FOR LONG PERIODS

The physiologic tests with ozone so far dealt with involve an ozone concentration that might be employed in experimental therapeutics, but which is out of the question for the purposes of ventilation. For ventilation purposes the ozone must not reach a concentration that leads to irritation and obvious injury, or too intense odor. This concentration is considerably below 1 part of ozone per million parts of air. Most people can probably tolerate a strength of the ozone odor represented by an ozone concentration ranging from 1 in twenty millions to 1 in five millions, although to some persons even the faintest odor of ozone is disagreeable. What is the physiologic action of ozone at such low concentration? On this point we have the assertions of parties financially interested, and the assertions of enthusiasts not hampered by a critical judgment, but practically no facts. Thus we are told that a few months' use of ozone in the ventilation system increased the chest expansion of office workers by several inches; that the favorable influence of mountain climates is due to the trace of ozone in the mountain air, etc.

Bohr and Maar and Hill and Flack have shown that ozone depresses the gaseous exchange in the lungs before there is any demonstrable injury to the lung tissues, or in concentration too weak to produce inflammation and edema. This would constitute a decidedly injurious influence of ozone. But it is obvious that the ozone concentrations employed by these observers were greater than that permissible in practical ventilation.

Concentrations of ozone of 1 part per million parts of air are certainly injurious, but it does not follow that the weaker concentrations of ozone are proportionally injurious. It is furthermore certain that the animal organism is capable of compensating for or repairing very slight injurious actions of ozone as well as of other toxic substances. It will therefore be very difficult to obtain reliable evidence as to any favorable or unfavorable physiologic action of such ozone concentrations as are practicable in ordinary ventilation. Nevertheless the following test was carried out:

Four cats, four rabbits, six guinea-pigs, and twelve rats were placed in comfortable cages in a room of twenty-six cubic meters' capacity. The ventilation

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arrangements of this room were such that the air of the room could be renewed at a rate varying from thirty minutes to about twelve hours. The room was provided with double doors and double windows. The inside door was provided with a large glass panel, so that it was possible to observe the animals without entering the room. The ozonator was placed in the room in such a position that none of the animals were in the direct line of the ozonized air current. The samples of air from the room for the ozone estimations were secured by glass-tubing connections through the wall. The glass tubing was placed so that air samples could be taken near the floor near the ceiling, and midway between the floor and the ceiling.

When the number of animals mentioned were in the room, and the rate of exchange of the air in the room was adjusted to about two hours, running the ozonator at the highest concentration capacity for five minutes brought the ozone concentration in the room up to about 1 part per million parts of air. In from twenty-five to thirty minutes after stopping the ozone generator, the ozone in the room had been removed or decomposed to such an extent that it was no longer irritating to the eyes and nose; but it could still be detected by its odor. At this point the ozonator was again turned on for five minutes. This process was kept up for about nine hours each day (from 8 a. m. to 5 p. m.) for a period of two weeks.

The points taken into consideration were, body-weight, appetite and general condition. The animals were kept in the cages in this room from February 24 to March 10, that is for two weeks before the ozone test was started, in order to secure controls. We aimed to select only healthy and vigorous animals, but one of the rats proved to have advanced tuberculosis of the right lung. This rat developed marked irregularities of the respiration at the end of the first week of the ozone exposure, and died on the tenth day. Post-mortem examination showed pneumonia ("red hepatization") of the lung not affected by tuberculosis. It is not improbable that this pneumonia was caused by the ozone, but no conclusion can be based on a single case.

One of the rabbits proved to be pregnant, and gave birth to two young ones, March 21, that is, on the eleventh day of the ozone exposure. One of the young was still-born and weighed only 60 gm., and the mother neglected the other one. We are of the opinion that the birth was a premature one by at least a week. It was noted that the new-born rabbit was more strongly affected (irregularity of respiration) by the ozone than the adult rabbits.

Each animal was weighed once a week. The general summary is presented in Table 7 [omitted]. All the animal groups showed some increased body-weight, but the increase during the control period is practically the same as during the ozone period. Slight differences are of no significance. Hence, as regards appetite and body-weight the results of the test are negative, the ozone appearing to have neither a favorable nor an unfavorable influence. This applies also to the general conditions of the animals. The cats did not seem disturbed even when the ozone concentration approached one to a million, but this concentration caused some restlessness in the rabbits, guinea-pigs and rats. In all other respects the animals appeared to be normal.

We desire to state, however, that this test does not warrant the conclusion that the ozone concentrations that may be used in practical ventilation is harmless to man. Two weeks is a short time in the life of a man. If ozone in ventilation should come into general use, it would mean in the case of office- and shop-workers exposure to ozone from six to ten hours a day, six days of the week, from nine to twelve months of the year for from twenty to fifty years. And even if this prolonged exposure to ozone should prove harmless to the robust person, what about the unfortunate person whose lungs have only slight power of resistance?

[Review omitted.]

EXPERIMENTAL PROCEDURE

Our tests were conducted in the room used for the prolonged test on the animal groups. The room was of convenient size (26 cubic meters) and permitted adequate control of the rate of renewal of the air.

The following odorous substances were used: ammonia vapor, hydrogen sulphid, oil of cloves, asafetida, human feces, stale (or decomposed) urine, meat in advanced decomposition, musk, the odor of rose and the odor of lilac.

We aimed to secure comparable concentrations of the odors in the room by evaporating fixed quantities of the odorous material, and by exposing equal quantities of the odorous substances equal lengths of time. The rate of disappearance of the odors from the room under uniform conditions of the room ventilation was noted and this constituted our control. The ozone tests were made with reference to these three points:

1. The concentration of the ozone required to mask the odors.

2. The possible destruction of the odorous substances by ozone in strong concentrations.

3. The possible destruction of the odorous substances by ozone in concentrations just sufficient to mask the odors.

RESULTS

Our results agree with those of Erlandsen and Schwarz, Hill and Flack, and Konrich as regards the power of ozone in strong concentrations to mask all the before-mentioned odors. With the exception of ammonia and the oil of cloves all of these odors are completely masked by ozone below a concentration of one to a million. The masking of ammonia and clove oil requires a much stronger concentration of the ozone, a concentration sufficient to cause marked irritation and headache even on short exposure.

When the ozonator was allowed to run just long enough to cause complete ozone masking of the odors there was no appreciable destruction of the odorous substances by the ozone. The ozone odor disappeared before the specific odor under investigation, and the rate of disappearance of the latter was approximately the same as in the control tests.

Strong concentrations of ozone (from 2 to 5 parts to the million) hastened somewhat the rate of disappearance of the odors of feces, stale urine and decomposing meat. Strong concentrations of ozone are therefore capable of causing some destruction of these odorous substances. In the case of the other odors there was no evidence of actual destruction by ozone in concentrations up to 5 parts per million. Stronger ozone was not tried.

The inability of ozone to oxidize (to any appreciable extent) ammonia vapor and oil of cloves is very striking. These odors may be masked three or four times in succession during a single test, and the ozone disappear sufficiently for the specific odor to be smelled.

The mechanism of this masking action of ozone does not concern us here. Two factors appear to be involved. First, the preponderance of the powerful ozone odor in consciousness, and secondly, a fatigue of the olfactory end-organs by the ozone. Strong concentrations of ozone rapidly fatigue or anesthetize the olfactory epithelium. From 5 to 10 parts of ozone per million parts of air can be smelled for less than a minute despite its continued presence in the nose. After the first minute one is aware of the ozone irritation but not the ozone odor.

The assertion is frequently made by parties financially interested in the practical uses of ozone that "ozone destroys smoke." "Smoke" is composed of particles of carbon or soot plus various gases, such as carbon monoxid, sulphurous acid, etc., depending on the material burnt and the availability of oxygen during the process of combustion. But as ordinarily understood the word "smoke" means essentially particles of carbon or soot. And when the assertion is made that "ozone destroys smoke," the average reader takes that to mean that ozone destroys soot. Such an assertion is equivalent to a deliberate deception, because there is no evidence that ozone even in the greatest possible concentration can oxidize carbon particles suspended in the air in the form of smoke or soot. The inability of ozone to "destroy" carbon particles in the form of smoke or soot can readily be demonstrated by the following experiment: A piece of glazed paper is coated uniformly with a thin film of lamp-black or soot, the paper cut in halves, one part fixed in shellac for control, and the other part exposed to ozone. We have exposed such smoked paper 2 inches in front of the generator running at the highest concentration (10 parts per million) for ten consecutive hours without the slightest reduction of the amount of soot on the paper. If this is true in the case of ozone in very great concentration it must be true of ozone in concentrations that are permissible in actual ventilation.

SUMMARY AND CONCLUSIONS

In view of the evidence already in existence, the hygienic value of ozone in room ventilation would be hardly worth considering were it not for the persistent and sometimes extravagant claims made by the manufacturers and promoters of ozone generators.

So far as the destruction of bacteria is concerned, these claims have little or no foundation. Some bacteria are undoubtedly killed by ozone, especially if they are in a moist condition and are in contact for several hours with a current of ozone coming direct from the generator. In practice, however, the fact is of slight importance. Human beings are injuriously affected by amounts of ozone far less than are necessary to produce even this slight bactericidal effect, and there is no evidence for supposing that a quantity of ozone that can be tolerated by man has the least germicidal action. If disinfection of a closed room without inmates is desired, this can be much more effectively carried out by the use of formaldehyd or some other familiar gaseous disinfectant than by ozone. Ozone has no place in practical room disinfection.

Ozone is not an actual "deodorizer" in concentrations that can obtain in practical ventilation. In very great concentrations ozone seems capable of oxidizing some odorous substances so that the odors are diminished or changed, but the change may be in the direction of increasing the disagreeableness of the odor. In very great concentrations ozone "masks" most odors by its own intensive odor, and possibly by fatigue or anesthesia of the olfactory epithelium. Certain odors are masked by ozone even in weak concentrations. Is such masking of odors desirable and generally advantageous? We think not. It is probable that the injury to the respiratory tract by ozone in sufficient concentration to act as an effective mask is of greater moment than the deleterious action of most odors. Except in special industrial processes, the unpleasant odor of the inspired air in shops, offices or living-rooms is usually a sign that the air needs to be renewed or changed as regards not only the percentage of odorous substances, but also, and of greater importance, the percentage of moisture and the degree of temperature. Why should we put out of commission the sense organ which aids us in determining whether or not the air is fit to breathe? It seems to us that this is wrong in principle, and that ozone is being used and will be used as a crutch to bolster up poor ventilating systems. Ozone does not make "pure air" any more than strong spices make pure food.

In concentrations that appreciably affect man and animals, ozone appears to have uniformly an injurious action. This injurious action is primarily on the respiratory passages—irritation of the sensory nerve endings, and irritation, corrosion and depression of the epithelial cells. The depression of the alveolar epithelium leads to changes in the gaseous exchange in the lungs, and secondarily to changes in the blood. The ozone headache is due to irritation, corrosion and consequent hyperemia of the frontal sinuses. The depression and drowsiness which are produced by ozone are due to the intense irritation of sensory nerve endings in the respiratory tract as well as to the secondary effects of the change in the activity of the alveolar epithelium.

Hill and Flack[7] point out that ozone gives a certain "tang" to the air, and thus relieves the impurity of the air (temperature and moisture) which is apt to obtain in the air in offices and assembly-rooms. This tang is a combined effect of ozone odor and the ozone irritation of the sensory nerves in the respiratory tract. We have seen that this acts (reflexly) on the vascular mechanism and it may temporarily "whip up" a fagged brain. But is this ozone tang any more beneficial or any more physiolgic than a whiff of smelling-salts or a puff of the cigarette? We rocognize that a certain amount of variation in the rate of movement and in the temperature of the air about us aids in maintaining the tonus of the brain, but our ventilation engineers must reproduce the variability of outdoors by actual variations in the air and in the rate of movement of the air in the ventilating systems, and not by adding a poisonous gas to the air. Nor can we accept the suggestion of Hill and Flack that small amounts of ozone may be of therapeutic value in certain diseases of the respiratory tract by reason of the hyperemia following the ozone irritation. The ozone irritation leads to intense hyperemia of the respiratory tract, but this hyperemia is obviously correlated with repair of the injury to the epithelial cells wrought by the ozone. The cells injured by ozone are probably more readily invaded by bacteria, and have less than normal power of growth and healing despite the hyperemia. And all bacteria so far studied are much more resistant to ozone than are the cells of the respiratory tract of man and experimental animals. The physiology of ozone points to the conclusion that the use of this poisonous gas as a therapeutic agent is either valueless or injurious.

V. 6
1913

THE ALLEGED PURIFICATION OF AIR BY THE OZONE MACHINE*

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The experiments of a number of careful investigators have discredited the claims made for ozone as a purifier of air. Largely on the basis of claims already disproved, several manufacturers are so successful in introducing ozone machines into public buildings that this purposeful adulteration of the air with ozone and its accompanying impurities threatens to become a public health problem.

Ohlmüller[1] demonstrated that ozone in considerable strength was incapable of killing dry bacteria within the time-limits of his tests. Erlandsen and Schwarz[2] showed the falsity of the claim that the presence of free ozone means the absence of organic impurity in the air. They demonstrated, through careful analyses, that ammonia and hydrogen sulphid were not diminished in amount by the presence of ozone. They showed also that the deodorizing property of ozone consisted of the masking of one odor with another. In their experiments with a number of odorous substances, the masked odors again became evident when the odor of the ozone had diminished. Filipow[3] demonstrated that strong concentrations of ozone in respired air caused a marked irritation of the mucous membranes. Hill and Flack[4] showed that a concentration of ozone as small as one part per million was irritating to the respiratory tract and that exposure for two hours to fifteen or twenty parts per million was not without risk to life. They demonstrated that the respiratory metabolism was reduced by the inhalation of ozone.

In September, 1912, the fifteenth annual convention of the League of California Municipalities and the fourth annual conference of state, county, and municipal health officials were held on the campus of the University of California. In connection with these meetings there was a "Public Welfare Exposition" consisting chiefly of the exhibits of manufacturers. An attempt was made by the agent for an ozone machine (designated in this paper as "Machine A") to display his apparatus and literature in that part of the exhibit which was devoted chiefly to foods and was under the supervision of M. E. Jaffa, director of the State Food and Drug Laboratory. Jaffa refused to permit the ozone machine to be exhibited, on the ground that the advertising circulars made claims which could not be true. The decision was protested and was referred to the director of the Hygienic Laboratory of the California State Board of Health, who sustained it, laying special stress on the false claims of bactericidal efficiency for ozone. This action was repeatedly protested, and requests were made that the machine be given a laboratory test. As a result the few simple experiments reported in this paper were performed with the ozone machines of two well-known companies. It was proposed to show the relative killing power for animals and bacteria. No attempt was made to measure the quantities of ozone, oxids of nitrogen, or other gases, which may have been included in the composition of the "ozone" produced by the machines.

The machines examined were loaned for our tests by the local agents of the manufacturers, and we wish to express our appreciation of the uniform courtesy which was extended to us.

Machine A was intended for use in a large room containing about fifteen people. Unlike Machine B, it had no attached apparatus for agitating the air. Circulars put out by the manufacturers state that ozone is a "necessity" for the destruction of infectious germs and bacterial life, for the sterilization of air in operating-rooms, for the purification of the air in homes of persons suffering from contagious diseases, and for giving to offices and homes the invigorating air of the country, seashore and mountains.

Machine B also was intended for purifying the air of a large room. The machine included a motor and fan for blowing air through the apparatus and out into the room. A well-illustrated advertising pamphlet from the manufacturers includes the statement that ozone cannot exist except momentarily in air containing organic matter, and that therefore the presence of ozone is an indication that the air is sterile and devoid of organic matter. In a quoted article the pamphlet asserts that ozone is unique as a germicide by reason of the fact that it has no deleterious effect on the higher forms of animal life, owing to the low percentage of carbon contained in their structure.

For our experiments a tight wooden cabinet with a capacity of 1 cubic meter was constructed. The door of the cabinet had a glass window which permitted a view of the interior. The ozone machine under test stood in the middle of the cabinet. The humidity was indicated by wet- and dry-bulb thermometers. In some of the experiments the humidity of the air was increased by pouring hot water through a tube into a dish standing in the cabinet. The guinea-pigs which were subjected to the "ozone" were placed in a small wire cage where they could be seen through the glass door. The bacterial cultures used were grown for a day on meat-extract broth. Sterile glass rods were dipped into the cultures and the broth was dried on them in an almost invisible film. These rods were fixed in large corks and were inserted into the cabinet through holes drilled near the top. After exposure to the "ozone" the rods were withdrawn and their ends were dipped into tubes of broth. After forty-eight hours of incubation, the clouded cultures were tested to find whether or not the growth was due to the organism originally placed on the rod. The streptococcus and staphylococcus cultures in all instances showed organisms of the characteristic morphology. The typhoid cultures were tested by agglutination with antityphoid serum. The cultures of *Bacillus subtilis* were sufficiently identified by the appearance of the scum growing on the surface of the broth. In the tables the plus sign denotes that the organism exposed in the test grew in the subculture. The minus sign signifies that the subculture was sterile.

The experiments with Machine A were made in several separate tests, and the results are brought together in Table 1. The cultures which were dried on threads

* From the Hygienic Laboratory of the California State Board of Health and the Laboratory of Hygiene of the University of California.

1. Ohlmüller: Ueber die Einwirkung des Ozons auf Bakterien, Arb. a. d. k. Gesdhtsamte, 1893, viii, 229.
2. Erlandsen, A., and Schwarz, L.: Experimentelle Untersuchungen über Luftozonisierung, Ztschr. f. Hyg. u. Infectionskrankh., 1910, lxvii, 391.
3. Filipow, M.: Zur therapeutischen Bedeutung von Sauerstoff und Ozon, Arch. f. d. ges. Physiol., 1884, xxxiv, 335.
4. Hill, L., and Black, M.: The Physiologic Influence of Ozone, Proc. Roy. Soc., London, Series B, 1912, lxxxiv, 404.

were placed in open Petri dishes on the bottom of the cabinet. The control cultures were exposed to the air in a locker in the laboratory.

Guinea-pig 1 seemed sluggish and was breathing rapidly at the end of an hour. In two hours and forty minutes it was dead. Necropsy showed marked edema of the lungs.

The tests with Machine B were carried on both with and without added moisture. The various cultures and the guinea-pig were put into the cabinet and the machine was started at the time of beginning each experiment. The door was not opened until the test was finished.

Guinea-pig 2 showed labored breathing twenty minutes after the machine was started. Twenty-five minutes after beginning, it began rubbing its nose with its fore feet; after forty-five minutes it was drowsy; at the end of an hour its eyes were watery and almost closed, and its nose was wet. After an hour and a half its breathing was irregular and spasmodic. A little later there were convulsive movements. After an hour and forty minutes it was struggling for air and in an hour and fifty-five minutes it died. Necropsy showed marked edema of the lungs. They did not collapse and were filled with foamy fluid.

As all the guinea-pigs showed similar symptoms during life and marked edema of the lungs on necropsy, details will be omitted in the subsequent experiments.

Guinea-pig 3 died four hours and thirty-three minutes after the machine was started.

Guinea-pig 4 died one hour and thirty-five minutes after the machine was started.

In a fourth test of Machine B the conditions were the same as those shown in Table 4, except that the machine was run at strength 1, instead of at the highest strength. The experiment was begun at 9:40 a. m., June 2. No moisture was added to the air, and the average of the humidity estimations was 62.9 per cent., which is lower than the average (73 per cent.) of the readings in Table 4. The average temperature was 20.3 C. (68.5 F.), which is two degrees lower than the average during the previous test. A table of the results is not presented as the four kinds of bacteria withstood the entire twelve hours of exposure. The guinea-pig (weight, 325 gm.) died in less than one-eighth of that length of time. It showed disturbance of respiration almost immediately after the machine started and died one hour and twenty-five minutes later.

The agents for Machine B sent us another machine (C), which was similar to the other, although of lower capacity. When it was run at the greater of its two possible strengths, without the addition of moisture to the air of the cabinet, the results were similar to those presented in Table 3 for Machine B. This showed that the results obtained were not due to individual imperfections in one machine.

Comparison of the tables shows that the addition of moisture to the air in the cabinet increased the slight bactericidal effect of the "ozone." In every test in which the guinea-pig and the bacteria were in the cabinet together, the bacteria outlived the guinea-pig.

Additional tests of the bactericidal power of the "ozone" were performed in two bedrooms in a dwelling-house. A room containing 730 cubic feet of air-space was prepared by packing the spaces about the windows and doors with cotton. A similar room was used for exposing control cultures to the drying influence of air. In testing the ozone machines in the room the same varieties of bacteria were exposed as in the tests with the corresponding machines in the cabinet, and the cultures were dried on glass rods in the same manner. Machine A was run at its maximum strength for sixteen hours in the closed room. Subcultures were made when the room was

TABLE 1.—MACHINE A. FULL STRENGTH.

Cultures: 24-hour. Dried on glass rods and silk threads. Extract broth, 1 per cent. acid.
Dates: February and March, 1913. Moisture added to air. Humidity not measured.

Length of exposure to "ozone", hours	½	1	2	3	4	5	6	7	8	Controls in Air 8
Cultures on rods:										
Staphylococcus aureus	+	+	+	—	—	—	—	—	—	+
Staphylococcus aureus	+	+	+	+	—	—	—	—	—	+
Bacillus typhosus	+	+	+	+	+	—	—	—	—	+
Bacillus typhosus	+	+	+	+	+	+	—	—	—	+
Bacillus subtilis	+	+	+	+	+	+	+	+	+	+
Bacillus subtilis	+	+	+	+	+	+	+	+	+	+
Cultures on threads:										
Staphylococcus aureus	+	+	+	+	+	—	—	—	..	+
Bacillus typhosus	+	+	+	+	+	+	+	+	..	+
Bacillus subtilis	+	+	+	+	+	+	+	+	..	+
Guinea-pig 1			Sick		Dead					

TABLE 2.—MACHINE B. STRENGTH 3.

Cultures: 19-hour. Dried on glass rods. Extract broth, 1 per cent. acid.
Date: May 27, 1913. Time: Started 10:40 a. m. Moisture added to air.

Length of exposure to "ozone," hrs.	0	½	¾	1	2	3	4	6	8	12	Controls in Air 12
Temperature, centigrade	18	21	22	22	25	22	22	21	21	20	18
Relative humidity, per cent.	74	79	77	80	77	87	84	86	86	85	..
Cultures:											
Streptococcus pyogenes	..	+	+	+	+	—	—	—	—	—	+
Staphylococcus aureus	..	+	+	+	+	+	—	—	—	—	+
Bacillus typhosus	..	+	+	+	+	+	—	—	—	—	+
Bacillus subtilis	..	+	+	+	+	+	+	+	+	+	+
Guinea-pig 2, 314 gm.		Sick			Dead						

TABLE 3.—MACHINE B. STRENGTH 1.

Cultures: 24-hour. Dried on glass rods. Extract broth, 1 per cent. acid.
Date: May 28, 1913. Time: Started 9:45 a. m. Moisture added to air.

Length of exposure to "ozone," hrs.	0	½	¾	1	2	3	4	6	8	12	Controls in Air 12
Temperature, centigrade	18	19	21	21	23	24	24	24	25	25	18
Relative humidity, per cent.	81	75	76	85	82	80	80	80	77	77	..
Cultures:											
Streptococcus pyogenes	..	+	+	+	+	+	+	+	+	—	+
Staphylococcus aureus	..	+	+	+	+	+	+	+	—	—	+
Bacillus typhosus	..	+	+	+	+	+	+	+	—	—	+
Bacillus subtilis	..	+	+	+	+	+	+	+	+	+	+
Guinea-pig 3, 712 gm.		Sick						Dead			

TABLE 4.—MACHINE B. STRENGTH 3.

Cultures: 19-hour. Dried on glass rods. Extract broth, 1 per cent. acid.
Date: May 29, 1913. Time: Started 9:40 a. m. No moisture added to air.

Length of exposure to "ozone," hrs.	0	½	¾	1	2	3	4	6	8	12	Controls in Air 12
Temperature, centigrade	18	20	21	23	23	23	23	23	24	24	20
Relative humidity, per cent.	70	66	74	61	69	75	75	80	80	80	70
Cultures:											
Streptococcus pyogenes	..	+	+	+	+	+	+	+	+	—	+
Staphylococcus aureus	..	+	+	+	+	+	+	+	+	—	+
Bacillus typhosus	..	+	+	+	+	+	+	—	—	—	+
Bacillus subtilis	..	+	+	+	+	+	+	+	+	+	+
Guinea-pig 4, 277 gm.		Sick			Dead						

opened, and the organisms grew in all instances. Machine B was run at its maximum strength (No. 3) for sixteen hours in the same room. The cultures all survived the test, but a guinea-pig (weight, 213 gm.), which had been put in a cage in the room, was found dead when the door was opened. Necropsy showed edema of the lungs. The humidity of the air in the room at the beginning of the test was 61 per cent. of saturation and the temperature was 22 C. (71.6 F.). When the room was opened in the morning a faint haze was visible in the air.

During these tests certain physiologic effects of the "ozone" were noticed by the experimenters after they had been working around the machines. The immediate effect of inhaling the diluted gas was a feeling of dryness or tickling in the nasopharynx, and sometimes the irritation was felt in the chest. If the exposure was prolonged, watering of the eyes, and occasionally a slight headache, resulted. The smell of the "ozone" and its irritation was much more noticeable to persons who came suddenly under its influence than to those who were continuously exposed. This shows the disadvantage of entrusting the regulation of an ozone machine to persons who are constantly breathing its products.

CONCLUSIONS

1. The gaseous products of the two well-known ozone machines examined are irritating to the respiratory tract and, in considerable concentration, they will produce edema of the lungs and death in guinea-pigs.

2. A concentration of the gaseous products sufficiently high to kill typhoid bacilli, staphylococci and streptococci, dried on glass rods, in the course of several hours, will kill guinea-pigs in a shorter time. Therefore these products have no value as bactericides in breathable air.

3. Because the products of the ozone machines are irritating to the mucous membranes and are probably injurious in other ways, the machines should not be allowed in schools, offices or other places in which people remain for considerable periods of time.

4. The ozone machines produce gases which mask disagreeable odors of moderate strength. In this way the machines can conceal faults in ventilation while not correcting them. Because the ozone machine covers unhygienic conditions in the air and at the same time produces new injurious substances, it cannot properly be classed as a hygienic device.

CAUSES, TYPES AND TREATMENT OF DIARRHEA IN ADULT LIFE*

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We have undertaken a fresh study of this ancient problem, beginning with the necropsy records of Bellevue Hospital in New York and the Massachusetts General Hospital in Boston. In each of these institutions we examined three thousand necropsy records, searching for lesions ordinarily supposed to produce diarrhea. We then traced the cases showing these lesions back to the clinical records, trying to ascertain first whether the lesions actually produced diarrhea, and if so, in what proportion of cases; secondly, whether any special type of symptoms or of discharges was associated with any special lesion of the intestine, the endeavor being to mark out clinical types so far as this was possible. Finally, we reviewed the results of treatment both in necropsy cases and in a considerable series of cases which did not come to necropsy, and endeavored to estimate the value of the different methods used.

For various reasons we have excluded from this study certain diseases often associated with diarrhea. We have taken no account of the cases of typhoid fever, partly because the relation of this disease to diarrhea has already been thoroughly studied in large groups of cases, and, secondly, because we were anxious to get some idea of the relative frequency of the different cases with this symptom, and we are well aware that the number of persons sick with typhoid in these two hospitals was not a fair sample of the number of cases of this disease existing in the community outside, since cases of typhoid are quite abnormally collected from large areas in hospitals such as those in which we have pursued our studies. The parasitic diarrheas have also been excluded because of the small number of these cases available in Boston or New York. We have made no effort to study the cases of mercurial or arsenical poisoning or cases of dysentery due to organisms of the Shiga type, or other organisms closely allied to it. We have also excluded all cases occurring in persons under 16 years of age. Leaving out the types just mentioned, we have studied 640 cases of the varieties ranged in Table 1.

TABLE 1.—RELATIVE FREQUENCY OF DISEASES CAUSING DIARRHEA IN ADULTS—MASSACHUSETTS GENERAL HOSPITAL, 1905-1912

Acute enteritis and unknown (acute) causes—clinical cases.		244
Acute enteritis—necropsied cases:		
"Primary"	9	
Secondary with and without intestinal lesions:		
Nephritic	10	
Cardiac	2	
Cardiorenal	2	
Arteriosclerotic	3	
Acute infections	5	
Various acute and chronic conditions	10	
Intussusception	1	
		42
Acute enteritis total		286
Chronic enteritis and unknown (chronic) causes—clinical cases		139
Chronic enteritis, necropsied cases:		
Primary	8	
Cardiac	7	
Renal	1	
Cardiorenal	1	
Various chronic conditions	2	
		19
Chronic enteritis total		158
Cancer of bowel		52
Pernicious anemia		34
Mucous colitis		32
Exophthalmic goiter		25
Nervous diarrhea		17
Tuberculosis of bowel		15
Ameblc dysentery		14
Fat intolerance		7
Total		640

DIFFICULTY OF DISTINGUISHING ACUTE FROM CHRONIC ENTERITIS AND COLITIS

It would have been desirable to distinguish clearly the acute from the chronic cases, but this we found unexpectedly difficult. The intestine is like the kidney in that a long-standing disease may show clinical symptoms only now and then, presenting itself suddenly under the guise of an acute disease.

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* Because of lack of space, this article is abbreviated in THE JOURNAL. The complete article appears in the Transactions of the Section and in the author's reprints.

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-fourth Annual Session, held at Minneapolis, June, 1913.

After making these exclusions and explanations we turn to the first portion of our study.

CAUSES OF DIARRHEA

"Indiscretions in diet" have long been blamed for a large proportion of the brief diarrhea occurring in adults as well as in children. There is no reason to doubt that these indiscretions are in a certain number of cases responsible, but a careful analysis of the records shows that many patients suffering from precisely the same symptoms as those supposedly due to indiscretions of diet have in fact committed no such indiscretions and eaten nothing unusual.

Among a group of eighty-nine patients suffering from acute benign diarrhea, presenting in the stools no evidence of bowel ulceration and recovering within from ten to fourteen days, forty-one patients ascribed the trouble to some supposed indiscretion in diet or to some food believed to have been poisonous, while forty-eight patients, exhibiting precisely the same symptoms, signs and course remembered no dietetic cause for their trouble and, indeed, no obvious cause of any kind.

"Ptomain poisoning" is one of the commonest, one of the most popular and fashionable diagnoses of the day among a certain class of practitioners. Yet this diagnosis will seldom stand criticism. Many of the cases to which this name is given turn out to be appendicitis, gall-stones, intestinal obstruction, pancreatitis, a gastric crisis in tabes, lead-poisoning and other diseases having nothing to do with ptomains.

We have merged in a single group a large number of cases variously designated on the clinical records because there seemed to be no good reason for the employment of the different terms such as dysentery, gastro-enteritis, enteritis, enterocolitis, colitis, etc. To the same group of cases, now one, now another of these terms is applied without any clear reason, according to the taste and fancy of the individual physician.

In a small group of cases, only seven, in the Massachusetts General Hospital series during a period covering the years from 1895 to date, there has seemed to be a genuine intolerance of the intestine for one or another foodstuff, chiefly fat. Intolerance for a protein or a carbohydrate was very rarely identified, but in the small group of cases previously referrred to an excuse of fat was present in the stools on ordinary diet, and when a diet free from fat was given, the diarrhea ceased. In none of these cases was there any definite evidence of pancreatic disease or of any other organic cause for the anomaly, and no cases of diarrhea definitely to be referred to pancreatic disease were studied by us.

Passive congestion of the intestine is not a cause of diarrhea. This lesion was present in a large number of the cases of our series in which necropsy was performed, but was seldom associated with diarrhea.

Tuberculosis of the intestine is a favorite diagnosis among general practitioners confronted by intractable and chronic cases of diarrhea. In my experience such a diagnosis is almost never warranted, for it is likely to be made in patients showing no pulmonary lesions of tuberculosis and despite the well-known fact that tuberculous enteritis almost never occurs except as a complication of phthisis. A striking result of our studies was this: Even when there is a demonstrable tuberculosis of the intestine (complicating pulmonary disease) diarrhea occurs in only one case out of three. Thus in only ten out of thirty-one cases of tuberculous enterocolitis which came to necropsy at the Massachusetts General Hospital (32 per cent.) and in only twenty-nine out of one hundred similar cases studied post mortem at the Bellevue Hospital (29 per cent.) was diarrhea present. The two series of cases here support each other in a very striking way (Table 2).

Even when diarrhea occurs in patients suffering from distinct tuberculosis of the lungs, one is by no means certain that the flux is due to intestinal tuberculosis, for diarrhea is nearly half as common in cases of pulmonary tuberculosis without intestinal lesions as in cases with these lesions. Thus in 106 cases of pulmonary tuberculosis studied post mortem at the two hospitals referred to, fifteen, or 14 per cent., had diarrhea, although the intestines showed no lesions whatever. All this emphasizes the fact further to be insisted on that even when intestinal ulcerations are present in a case of diarrhea we are by no means certain that the ulcerations cause the diarrhea.

Cancer of the intestine was studied in 159 patients, post mortem or after operation, at the Massachusetts General Hospital, and in eighteen patients post mortem at the Bellevue Hospital. The percentage of diarrheas in these cases, taken as a whole, is almost identical with

TABLE 2.—RELATIVE FREQUENCY OF CERTAIN FATAL DISEASES ASSOCIATED WITH DIARRHEA (SIX THOUSAND NECROPSIES)

Disease	Bellevue Hospital 3,000 Necropsies		Mass. General Hospital 3,000 Necropsies		Per Cent. Having Diarrhea	
	Total Cases	No. of Cases of Diarrhea	Total Cases	No. of Cases of Diarrhea	Bellevue	Mass. Gen'l
Acute and chronic enteritis (unknown cause)	111*	45	71	32	40	45
Cancer of colon	18	4	64	20	22	32
Tuberculosis of intestine	100	29	31	10	29	32
Tuberculosis of the lungs; intestine not diseased	71	11	35	4	15	11

* Seventy classified as acute post mortem; twenty-five of these had diarrhea. Forty-one classified as chronic post mortem; twenty of these had diarrhea.

that found in tuberculous enteritis. Thus fifty-two, or 32 per cent., of the Massachusetts General Hospital cases showed a diarrhea either steadily or intermittently, while 22 per cent. of the Bellevue cases showed the same symptom. Contrary to the accepted idea on this subject, we did not find that diarrhea was any commoner in cases involving the lower part of the intestine than in those involving the upper part. Thus in forty-three cases of cancer of the rectum, diarrhea was present in 37 per cent., while in sixty-seven cases involving the hepatic flexure, the ascending colon or the cecum, diarrhea was present in 41 per cent. In thirty-two cases involving the intermediate portion of the colon including the transverse colon, the splenic flexure, and the descending colon (above the sigmoid), diarrhea was present in only 18 per cent.

In chronic renal disease, diarrheas of a supposedly compensatory type are often said to occur. Our studies did not tend to confirm this supposition, for in seventy-two cases of chronic nephritis diarrhea was present only eleven times either in the history previous to hospital treatment or during that treatment.

Intussusception has for many years been associated in text-books with a bloody diarrhea and been supposed to differ thereby from other types of intestinal obstruction.

This idea was borne out only to a limited extent in the cases studied in the present series, for only three out of ten showed any diarrhea at all.

We have had no opportunity to advance our knowledge on the subject of so-called morning diarrheas, the association of which with achylia gastrica has recently been referred to.

Closely associated with these, according to our belief, is the type known as nervous diarrhea or simple hyperperistalsis. Presumably there is some connection here between the hyperperistalsis and low blood-pressure in the peripheral blood-vessels with vasodilatation in the splanchnic area. The feeble rapid heart and the tendency to faintness in such cases goes to strengthen this supposition.

An important group of cases, not very numerous, fortunately for us, but very obstinate and mysterious, are those associated with intestinal ulceration of unknown cause. Many of these cases are demonstrably nonamebic and not due to infection by any known type of micro-organism. Some of them bear the marks of infectious disease—fever, leukocytosis and albuminuria. In others there is no such evidence. The diagnosis is made from the condition of the stools (see hereafter) or by proctoscopy. Sixty cases of ulcerative colitis of this kind were studied at the Massachusetts General Hospital, beginning with the necropsy record and following the case back into the clinical history. One hundred and eleven similar cases were studied at Bellevue Hospital. In 55 per cent. of the Massachusetts General Hospital cases and 60 per cent. of the Bellevue cases diarrhea was absent, and the diagnosis of intestinal ulceration or ulcerative colitis was often quite unsuspected before necropsy. Even when the colon is deeply and universally ulcerated, "hanging in rags" as one of my colleagues expressed it, the bowels may be constipated throughout the disease. Although there is nothing new about this statement, we desire to emphasize it afresh, since there is so strong a tendency to use the words diarrhea and enteritis as synonyms.

In cases of enteritis without diarrhea the diagnosis is, so far as we can see, impossible, unless something suggests proctoscopy. There may be no local tenderness in the abdomen and nothing whatever to indicate the disease. This silence is only what we might have expected from the analogy of typhoidal and tuberculous ulcerations, which produce in the great majority of cases constipation rather than diarrhea. Thus in only 17 per cent. of the 1,495 cases analyzed by McCrae in Osler's "Modern Medicine" was diarrhea present, though in every case presumably the intestines were extensively ulcerated. The conditions existing in tuberculous enteritis have already been referred to.

Finally we would lay especial emphasis on the fact obvious from the study of the cases in this series, that in many, perhaps most, cases of diarrhea the cause is utterly unknown. No evidence of infection, ulceration, food poisoning, cancer or other disease can be found. In some of these cases we have evidence that the patient has been subjected to unusual overstrain, such as may well have lowered his powers of resistance or upset the vasomotor tone of his splanchnic vessels. Thus loss of sleep and overwork often appear to be causative factors; but the intermediate steps between these trains and the diarrhea are not clearly known.

TYPES AND DIAGNOSIS

Can we recognize what part of the intestine is affected? Many text-books describe symptom-groups supposed to characterize diarrheas originating in the small intestine and in the large intestine, respectively. We have not been able, however, to identify any diarrheas originating in the small intestine. If there is a characteristic symptomatology for such cases we have not been able to find it. As regards the portion of the colon affected by disease one can say only this: that the presence of marked tenesmus points almost certainly to inflammation of the rectum. Beyond this we cannot go with any certainty.

The study of the stools is of much importance, especially in prognosis. Cases in which blood and pus are frequently present in the stools are almost certainly associated with ulcers of the large intestine and run a much more chronic course than those in which blood and pus are absent from the stools. The presence or absence of mucus in the stools seems to be of little importance, especially when there is no other abnormality. Mucus is not proper ground for the inference that enteritis or ulceration is present. In many persons mucus is passed from time to time without any disturbance of the general health and without any known reason whatever.

An excess of fat, starch or protein in the stools is much less often of value in diagnosis or prognosis than the evidences of ulceration just referred to. In the routine examination of stools for causes of diarrhea such an excess of food products is distinctly infrequent and rarely characterizes a case for more than a short time.

Proctoscopy is of great importance in prognosis. The presence or absence of ulceration in the rectum and sigmoid can readily be decided by this method and, other things being equal, a much longer course can safely be predicted in cases showing ulceration of this kind than in those free from it. Thickening and infiltration of the bowel wall may also be recognized in this way and may furnish evidence of a long-standing, relatively intractable process. In nine cases of the Massachusetts General Hospital series the *Amoeba histolytica* was recognized in the stools and led to the identification of amebic dysentery. Such cases, however, are rare in Massachusetts even as importations. In parts of the country in which the *Amoeba histolytica* is common, stool examination may be of the greatest importance as a means of identifying diarrheas of this type, since it may lead to their treatment by the recently discovered specific, emetin.

Diphtheritic colitis or enterocolitis produces no characteristic symptoms and no recognizable abnormalities in the stools. This was proved by the clinical record of diphtheritic cases in which necropsy was performed at the Massachusetts General Hospital.

Mucous colitis or colica mucosa is, in our opinion, not a colitis at all, but a form of neurosis associated with constipation and sometimes with starvation. Of twenty-two cases of this disease studied at the Massachusetts General Hospital in only ten was diarrhea present at any time and, even in those, constipation was much more frequent. As a cause and a result of their neurosis many of these patients have acquired the disastrous habit of examining their stools themselves and it is almost pathognomonic of the disease if the patient produces a bottle in which curious materials have been accumulated as the result of the patient's own study of his dejecta. Habit and the mental attitude are the essential factors in these cases and will be further referred to under the section on treatment.

Prognosis.—The general measure of effectiveness in the treatment of chronic diarrheas of all types may be seen from the following figures drawn from the records of the Massachusetts general hospital: Out of ninety cases of diarrhea lasting over four weeks previous to

hospital treatment, there were apparently cured fifty-four, or 60 per cent., and unrelieved (including deaths) thirty-six, or 40 per cent. We have called the favorable cases "apparently cured" because we have not often been able to follow their progress after discharge from the wards.

Further analysis of the results of treatment in twenty-five cases of chronic non-fatal diarrhea averaging about four years in duration shows that chronicity is not necessarily of bad prognostic import. It was found quite easy to check the process and even to cure it in twelve out of these twenty-five cases in which organic ulceration and infiltration of the bowel were not indicated by the presence of blood and pus in the stools or by proctoscopy. Chronicity then, does not necessarily mean intractability. Our fatal cases have rarely been chronic. They averaged less than four months in duration. In contrast with this were two cases diagnosed as nervous diarrhea and yielding readily to suggestive therapeutics, though they had lasted two years and five years, respectively.

Of thirteen patients with chronic ulcerated colitis, five were apparently cured, two were improved and six not improved at all.

Acute Diarrheas.—So far as duration measures severity, the non-ulcerated acute cases lasting five weeks or less were as severe as the ulcerated cases. The average duration of seventeen ulcerated cases (with blood and pus in the stools) was fourteen days before treatment began and thirty-eight days after treatment. In twenty-one non-ulcerated cases the average duration was thirteen days before treatment and twelve days after treatment.

The response to our therapeutic endeavors shows that the ulcerated cases were far more intractable. In seventeen out of twenty-one acute non-ulcerated cases, the movements ceased promptly after treatment by rest, diet and catharsis only. Three patients needed also saline irrigations and one bismuth. Opium and silver nitrate were never needed in this group of cases.

Of the seventeen ulcerated cases, on the other hand, only two yielded to rest, diet and catharsis alone. Three of these patients needed opium also, five needed bismuth, seven silver nitrate and eight normal saline irrigations. Three of the seven patients receiving silver nitrate had saline irrigations as well.

TREATMENT

The following experience has been frequently repeated in this series of cases and has left a deep impression on our minds: A patient seeks hospital care with a history of a most obstinate diarrhea which has persisted for months, even for years. He is put to bed in a hospital ward and before treatment is begun the preliminary investigation and preparation of his case occupy probably the first twenty-four hours of his stay in the hospital. During this time the remarkable fact is noticed that he has had no diarrhea, indeed that his bowels have not moved at all. In view of this fact no treatment for the previously troublesome diarrhea is instituted. One waits for the familiar symptom to appear; but it never appears. Day after day passes and finally the bowels have to be moved by enema or by a laxative. At first we interpreted the absence of diarrhea as a cure of the enteritis, but further observation of the patients, after they had left the hospital, showed that in many the diarrhea promptly reappeared as soon as the patient resumed his ordinary habits and occupation. In view of this it seems to us that one must interpret the disappearance of the diarrhea in such cases as due to the remarkable effect of lying in bed. And in fact lying in bed seems to us by far the most efficient and potent remedy at our command in a large number of the acute and the chronic diarrheas. Many of the patients just referred to had been treated unsuccessfully by every known method previous to entering the hospital, but had not remained in bed. That was the one thing that had not been done for them. How far this remedial effect of rest in bed is to be attributed to an effect on the splanchnic circulation we have no means of judging. It is well known that patients with diarrhea become faint, especially during and after the discharges. This faintness is doubtless associated with a low peripheral blood-pressure and it may be that rest in bed raises the average peripheral blood-pressure with a corresponding improvement in the splanchnic circulation. In some of these cases we have demonstrable evidence that the intestinal ulcerations associated with the diarrhea have shown no appreciable tendency to heal, even though the diarrhea itself has been wholly checked as a result of rest in bed.

The good results of purgation in all acute and benign cases are too familiar to need further emphasis. Our experience in this series of cases goes to support the traditional belief that purgation, by means of castor oil or magnesium sulphate, is second only to rest in bed as a remedy for diarrhea. We have seen no special reason to prefer one of these two purges to the other. Either is usually efficient. They are occasionally of value even in cases which have lasted for many weeks. But when definite ulceration is present in the bowel, purgation almost never gives more than temporary relief. Hence, the importance of proctoscopy and stool examination as a guide to treatment.

Diet.—For acute cases, from twenty-four to thirty-six hours' starvation with catharsis is the ideal treatment. Boiled milk has a long-enjoyed reputation, and many patients recover during (perhaps because of) its administration. In chronic cases it is the rule at the Massachusettes General Hospital to give a diet low in fats and carbohydrates.

Irrigations.—Daily irrigation of the lower bowel with warm normal saline solution seems to us of benefit in many obstinate cases. Astringents whether by mouth or by rectum have helped us little. Weak solutions of silver nitrate sometimes produce immediate benefit. If one injection does no good, it is not worth while to repeat it, especially as the remedy is always a painful one and occasionally makes the patient distinctly worse. Quinin injections for amebic dysentery deserve to be given up now that the use of emetin has been discovered. Injections of cooked starch or mucilaginous substances are useful to allay tenesmus.

Olive-Oil.—This substance has distinct value in the treatment of long-standing cases with or without ulceration. It has been extensively used in the Presidio Hospital at San Francisco for obstinate diarrheas in soldiers invalided home from the Philippines. We have used it successfully in doses of ½ ounce after meals in some ambulatory cases of chronicity, but have not yet distinguished the types most benefited or the method of its action.

Psychic Influences.—The good results produced by change of environment are, we suppose, mostly psychic. Morning diarrheas can often be promptly cured by a "change of air" and are sometimes very hard to cure in any other way. How far differences of food and of drinking-water may enter into this result is doubtful.

A most amazing result of a similar "change of air" was seen by one of us in 1898 when the hospital ship *Bay State* took on board from Porto Rican harbors 125

sick Massachusetts soldiers. Practically all of them were suffering from diarrhea of many weeks' duration and had become greatly discouraged and depressed. Within two days of their embarkation on a boat pointed for home, almost every man was free from diarrhea and eating ravenously of the two substances hardest to get in Porto Rico—bread and butter.

Drugs.—The subcutaneous use of emetin in amebic dysentery, as advised by Rogers, seems one of the most brilliant therapeutic results in the history of medicine. Our experience with this drug in a few cases wholly substantiates the reports of Rogers, Futcher, Bass and others.

Of opium we have nothing new to say. We all know its definite though limited value in acute cases, occasionally even in chronic cases to break up a pathologic habit.

Bismuth in doses of from 30 to 60 grains, from once to three times daily, seems to us of value in some obstinate cases when combined with rest and diet. The smaller doses formerly employed do not seem rational and have not been effective in our hands.

Sodium salicylate proved curative in one long-standing case which had resisted many other remedies.

Operation (Cecostomy).—Cecostomy and irrigation of the bowel, through the new hole, has been tried but little in our field of work and our experience does not warrant a definite opinion. Our impressions are not favorable.

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ABSTRACT OF DISCUSSION

DR. W. S. THAYER, Baltimore: Dr. Cabot suggested that in a large proportion of cases of diarrhea it is not possible to say just what the cause is. How are we going to find out? One of the first things we ought to do, a thing which too many of us neglect, is to examine the stools carefully. We can obtain many hints as to treatment from the character of the stools.

I should like to emphasize one of the various causes of diarrhea, namely, a diminished gastric acidity, or anacidity. It is a common cause of rather long-persisting and annoying diarrhea. Annoying diarrheas are relieved by larger doses of hydrochloric acid than are generally given. In many of these cases one may expect to find a large proportion of fatty acid in the stool. We found many cases of imperfect fat absorption associated with diminished gastric secretion. Most of the acute diarrheas are due to greatly varying causes. In a large majority of cases it is impossible to say just what causes the attack.

We are familiar with the nervous attitude of individuals suffering from so-called mucous colitis.

These patients are extraordinarily interested in themselves, and this is an element we have to consider. A nervous element is an associated element, and is not the cause of mucous colitis. The onset of mucous colitis in some instances is almost like that of hay-fever. One of my colleagues whose work as instructor begins in the spring, for three or four years, at about the beginning of May, has become ill with mucous colitis and never recovers until he has finished his teaching in June. When he is suffering from overstrain he has an attack of colitis. In many instances the tendency toward mucous colitis depends on small local foci of infection, and the relief of those conditions is followed by so great an improvement that the mucous colitis recedes to the background. Mucous colitis is also, as Dr. Cabot has said, more commonly associated with constipation, with occasional outbursts of diarrhea, nothing like a continuous diarrhea. The important factor in the treatment of diarrhea of whatever type is rest in bed. It is the hardest thing to do. If we could make our patients go to bed at the outset and stay there for a day or two, often the disease would be ended.

For the treatment of cases of subacidity, large doses of hydrochloric acid, from 20 to 30 drops, in a full glass of water, should be given three-quarters of an hour after meals, an hour and a quarter after meals and possibly again after that. The results in some instances are truly miraculous.

DR. P. S. ROY, Washington, D. C.: I wish to emphasize the giving of hydrochloric acid in diarrhea. Hydrochloric acid controls, in great measure, the opening and closing of the pylorus. The pylorus opens and lets food into the duodenum, and then does not open again until the acid that goes into the duodenum is overcome by the alkalinity of the intestine; therefore, I think that the opening and closing of the pylorus often has a great deal to do with diarrheal attacks. In other words, hydrochloric acid prevents the pylorus from opening and closing too rapidly.

Another point I wish to call attention to is nerve fatigue. Many persons who are not nervous suffer from fatigue diarrhea. The diarrheal attacks which many, though careful in diet and habits, have when attending conventions are largely due to fatigue. I also think that the diarrhea of exophthalmic goiter is a fatigue diarrhea. Exophthalmic goiter is nerve fatigue. Rest will therefore do much to correct the diarrhea.

DR. F. M. POTTENGER, Monrovia, Cal.: Frequently when diarrhea develops in a patient having tuberculosis, the attending physician makes a diagnosis of tuberculosis of the bowel and gives a bad prognosis. I often find that it is only a simple diarrhea and that when these patients are put to bed and treated properly the trouble disappears. It is important to bear in mind that diarrhea in a patient with tuberculosis does not mean dooming a patient to tuberculous enteritis.

Another factor which should also be understood is that tuberculosis of the intestine is often present when no diarrhea is present. This is shown by Dr. Cabot's charts.

A point on diagnosis: We have made seven hundred examinations of the stools in tuberculous patients and find that about two-thirds of those who have tubercle bacilli in their sputum show bacilli in the feces, most probably from swallowed sputum, whether any symptoms of tuberculosis of the bowel are present or not. This shows definitely that the finding of tubercle bacilli in the stools of patients having open tuberculosis is not a diagnostic sign of tuberculous enteritis.

DR. JAMES S. MCLESTER, Birmingham, Ala.: A form of diarrhea which is becoming increasingly frequent in the South and which is of more than local interest is that which precedes and accompanies pellagra. Not infrequently do we see a patient who first complains merely of diarrhea. Treatment accomplishes little. The following spring or summer other symptoms typical of pellagra appear. By noting the stomatitis and, perhaps, the exaggerated patellar reflex, we can at times recognize this form of diarrhea before the dermatitis develops. Examination of the stools is of no value. Bearing in mind the other nervous symptoms of pellagra, we might class this as a nervous diarrhea, and yet the coincident inflammation of all the mucous membranes suggests enteritis. On the other hand, all of these cases show much lowered gastric acidity—at times complete anacidity—which suggests even another cause of the diarrhea. Occasionally, the administration of large doses of dilute hydrochloric acid will check this distressing symptom of pellagra.

DR. G. D. HEAD, Minneapolis: In Minnesota we have been much interested in this group of diarrheas of which Dr. Thayer has spoken. We class these as the achylia gastrica type of diarrheas. We can do much for these patients by giving them large doses of hydrochloric acid.

I wish to ask Dr. Cabot one or two questions. In the first place, I should like to inquire whether or not in this group of cases, that is, the so-called achylia gastrica type of chronic diarrhea, he finds any pathology in the bowel. In the second place, whether or not he finds an achylia gastrica in his cases of exophthalmic goiter with marked diarrhea. We know that in pernicious anemia, with and without diarrhea, there is a high percentage of achylia gastrica, and it occurred to me that the same condition might obtain in the cases of exophthalmic goiter with diarrhea.

DR. SEALE HARRIS, Mobile, Ala.: There is one form of diarrhea that Dr. McLester referred to, which is of much more frequent occurrence than is generally supposed, and that is the diarrhea of pellagra. I am sorry to say that there are a large number of cases of pellagra that are not recognized, in which the important symptom, and oftentimes the only symptom, is diarrhea.

The Italian death-rate from pellagra, as reported, is less than 4 per cent. In the city of Chicago, in 1911, nine deaths from pellagra were reported. My experience leads me to believe that the death-rate from pellagra in this country is certainly no greater than it is in Italy, and, therefore, in Chicago, or in the surrounding country, from which, perhaps, the cases were referred to Chicago for treatment, there must have been two or three hundred cases of pellagra, most of which were not recognized because the only symptoms were diarrhea and other digestive disturbances. I am sure that in the South and in the South Central states there are a great many cases of diarrhea due to pellagra that are ascribed to other causes.

Dr. H. F. Harris of Atlanta maintains that a large portion of the population in certain sections is suffering from what he calls corn intoxication, in which the only symptoms are diarrhea and other digestive disorders. I have seen a number of cases of pellagra without any skin lesion in which I have made a positive diagnosis, the diagnosis having been based on the diarrhea, the stomatitis, the red glossy tongue and the other digestive symptoms.

In my experience, in at least three-quarters of the cases of pellagra, in which diarrhea is an important symptom, there is lowered gastric acidity or absence of hydrochloric acid. Dr. Clarence Johnson of Atlanta called attention to the fact that in his series of cases of pellagra in which the skin lesions and other symptoms distinctive of pellagra were present and there was absence of or decrease in hydrochloric acid, there was diarrhea, and in those cases in which there was no decrease in hydrochloric acid, there was no diarrhea.

The treatment of diarrhea in pellagra is the same as in diarrhea from any other cause. Rest is most important, preferably in a dark room, because sunlight not only brings out the skin lesions, but also increases the diarrhea and other digestive symptoms.

In cases with gastric anacidity or lowered acidity large doses of hydrochloric acid are indicated. Most important of all is the diet; eliminate the corn products, corn bread, hominy, etc., and confine the diet largely to nitrogenous foods.

DR. S. BAILEY, Mt. Ayr, Iowa: I want to compliment Dr. Cabot for being an iconoclast. I am glad he has the honesty and bravery to attack a popular fad, ptomain poisoning. We have all been extremely disgusted with what we have been told and what we have heard about it. I believe, however, that it will scarcely recover from the body blows which have been and will be inflicted from this time on.

DR. T. W. STUMM, St. Paul, Minn.: Undoubtedly the most important question to consider will be the cause of the diarrheal conditions. Regarding the cases mentioned by Dr. Thayer and Dr. Head, I should class them as gastrogenic diarrheas. Here in the Northwest we see many of these cases and we usually secure good results in cases of true achylia gastrica by the administration of hydrochloric acid, as Dr. Head suggests.

The other class of cases that we see are the cases of mucous colitis. They are frequently very troublesome. The patient is usually much run down in a general physical way and has been on special diet for months, and possibly for years. I have never seen any good result from placing these patients on a special diet. I am in the habit of telling my patients of this class to eat anything and everything—to take plenty of nourishment—bread, meat and potatoes. There are one or two things which seem to do good in a therapeutic way. One of these is belladonna pushed to the physiologic limit, given either hypodermatically or by the mouth. The second is the injection of cottonseed-oil or olive-oil per rectum; this is to be retained by the patient during the night. Some of the patients will retain a great deal of oil and others will retain only a small amount. This should be taken by the patient in a recumbent position when he goes to bed and as much oil should be injected as can be retained. With these two medicinal measures and a full general diet we can do a great deal for these patients. I class these cases as nervous cases entirely.

DR. RICHARD C. CABOT, Boston: Our discussion seems to have centered mostly around two points, the diarrheas associated with achylia and mucous colitis, so-called. I think that the diarrhea of achylia is one of the most interesting types before us, but I do not think that it is nearly so simple as it appears. Take, for example, the achylia of pernicious anemia. That is the best-known form of chronic achylia. Pernicious anemia patients have diarrhea, but much more of the time they do not have diarrhea, and when they are not having diarrhea they do have achylia. The point we ought to realize is that, while achylia is without doubt a factor, it is only one factor. We must find the others before we really know what we are dealing with in these cases.

The morning diarrheas, like the mucous colitis cases, it seems to me, are best treated by the psychic method. I have seen cases of this kind cured more quickly in this way than in any other way. Many cases cannot be cured in any other way. The best kind of psychic therapy here is usually a change of scene with change of water and food—what we used to call a "change of air." I think the change of environment, the psychic change, is the big factor, and reliance on that often brings results just as good as, if not better than, hydrochloric acid does.

A great deal used to be said about degeneration of the gastro-intestinal mucosa in pernicious anemia, but the more these cases have been studied the less it appears that the gastro-intestinal changes are causes. There are no sudden changes in the gastro-intestinal tract in pernicious anemia associated with achylia.

I cannot answer the question in relation to exophthalmic goiter because my experience is limited. In some cases I have found achylia during the period of diarrhea, and in others I have not. I do not know the relation.

Coming back to mucous colitis: I do not suppose that any of us believe in purely psychic causes. We all believe that the body and mind necessarily always work together. When I say that I think that the cause of mucous colitis is a psychic cause, I mean that it is the sine qua non and the factor with which treatment has chiefly to deal. Remove that cause and you cure the patient; if you do not remove that cause you cannot cure the patient. Doubtless there are other factors, but the psychic factor, together with constipation and starvation, as has been emphasized, is the great factor. Some of the most impressive cures I have ever seen have been cures of mucous colitis, in which the patient has been dieted, as the doctor said, in a variety of ways, without any result. The essence of the treatment is encouragement and stuffing.

REPORT OF A CASE OF ACUTE NEPHRITIS IN AN INFANT WITH CONGENITAL HEART DISEASE*

H. M. McCLANAHAN, M.D.
OMAHA

History.—The infant, aged 1 year, came under my care Jan. 4, 1913. Family history negative. Parents both young and in good health. The patient had been a blue baby from birth. Breast-fed for a time. Ever since birth it had had an inspiratory grunt, more perceptible when the child was moved or held erect. Both skin and mucous surface constantly blue. The infant had steadily gained in weight, however, weighing 24 pounds at 1 year of age. Digestion had always been good, bowels regular, urine free.

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

History of Attack.—Dec. 5, 1912, infant was suddenly taken sick with sore throat and fever, followed by a general erythematous rash. Later this rash was followed by a series of small vesicles. December 10 some swelling about the face was first noticed. The mother said breathing became more labored and rapid, so that she had to keep the child constantly in a recumbent position. Even then she noticed that the cyanosis was deeper in color. The bowels were regular, urine becoming more and more scanty as estimated by the napkins. Infant was more stupid than usual. Jan. 4, 1913, I noted the foregoing facts as given me by the mother. Temperature 100, pulse 110, respiration 70. Child vomited two or three times a day while under my care, always after feeding. There were edema of the face, swelling of the arms and legs, and ascites, with pitting along arms and legs. Physical examination of the lungs negative. Pericardial dulness very extensive. Cardiac impulse perceptible. Blowing murmur heard everywhere over heart. Temperature did not go above 100 until a few hours before death. Respirations varied from 60 to 80 per minute.

Examination.—Urine examination January 5. Specific gravity 1.007, acid, albumin by heat and nitric acid, no sugar, no bile. Under the microscope a number of white cells, hyaline and granular casts. January 7: Examination the same with the addition of many blood-cells. Blood examination January 5: Red blood-cells, 8,140,000; white blood-cells, 20,000; hemoglobin, plus. Slight increase in small lymphocytes; otherwise leukocytes normal. January 7: Red blood-cells, 9,800,000; white, 16,000.

Treatment—There was nothing special in the treatment during the time that the patient was under my care. The infant responded well to hot packs. It received sodium carbonate by enema and tincture of digitalis by mouth. General anasarca decreased and quantity of urine increased. There were absolutely no nervous symptoms. Respirations continued rapid. Cyanosis extreme when infant was lifted up. Death was due to apnea.

Clinical Diagnosis.—Acute nephritis due probably to scarlet fever with congenital heart disease. I am satisfied that death was simply hastened by this disease, but was actually due to the heart lesion. In other words, the nephritis was an added burden that the heart could not carry.

Post-Mortem Made Four Hours After Death.—I desire here to thank Dr. L. Moon, intern at the Methodist Hospital, for his very thorough work in preparing the sections from various organs. The body was that of a large, well-nourished infant; slight eruption over body; chest appeared very large, no deformities, skin soft and very dark, mucous membrane dark, muscles flabby, no rigor mortis. Brain not examined. Skin of chest and abdomen quite edematous on incision. Muscles dark red and very soft. No free fluid in the abdominal cavity, no ossification in the costal cartilages. Sternum very soft and porous. Thoracic cavity contained 20 c.c. of light straw-colored fluid. No pleural adhesions. Base of heart at second rib. Apex at the sixth rib. Left border extended outside of nipple line ½ inch. Right border 1 inch to the right of the sternum. Thymus present, but no evidence of pressure on the trachea. Pericardium contained 10 c.c. of clear fluid. No adhesions. The heart was 13 cm. long, 9 cm. wide, 7 cm. thick. It will be noted that this is the size of the adult heart. Heart muscles dark reddish-brown. Cavities contained a large amount of fluid blood. It was noted that there was scarcely any clotting of blood in any organ. Veins of heart greatly dilated. Foramen ovale was open and large; indeed, there was only a light constriction between the auricles, so that both formed practically one cavity. Left auricle was greatly dilated with thin walls. The aortic and pulmonary orifices were smooth and the valves normal. The mitral valve was greatly shortened and thickened, and would not close to exceed one-half of the opening. There was also a defect in tricuspid valve. Ductus arteriosus was not found although carefully searched for. Pulmonary vessels filled with blood. It will be noted that there was practically free communication between all the chambers of the heart, no obstruction to flow of blood to lungs and that the aorta could carry a sufficient quantity to nourish the body, but that there was free mingling of the venous and arterial blood. The spleen was dark, congested and very vascular. Bile passages normal. Stomach dilated, also dark in color. Gall-bladder normal. Pancreas hard to touch, and dark in color. Liver 17 cm. long, 7.5 cm. thick, 12 cm. wide, dark in color, greatly congested, bleeding freely on section. Lungs dark in color but no evidence of bronchitis or pneumonia. Left kidney 7.5 cm. long, 5 cm. wide, 4 cm. thick. Right kidney 5 cm. long, 4 cm. wide, 2.5 cm. thick. Both kidneys were firm to touch and dark red on section and showed on section that they were retained by the capsule under pressure, capsule thickened. Bone-marrow of ribs and sternum very dark in color. The entire appearance was one of chronic passive congestion and the great size of the heart and liver was most striking.

Microscopic Findings.—Kidneys show a marked interstitial nephritis with chronic passive congestion. Many cells show hyaline swelling with fatty degeneration, capsule thickened. Marked round-cell infiltration in all fields.

Spleen shows marked congestion with great increase in the connective tissue.

Heart muscle is atrophic with cloudy swelling and evidence of fatty degeneration.

Pancreas shows great increase of connective tissue with marked passive congestion.

Liver capsule thickened, connective tissue increased and marked. Fatty infiltration about the center of the lobules.

Bile ducts dilated and increased pigment.

The pathologist, Dr. W. R. Lavender, reports that the sections of all organs show a passive congestion due to the congenital heart disease, with an acute process due to the complicating nephritis. This is in line with what is usually found in congenital heart disease with cyanosis.

There were two interesting features in the case:

1. Evidence of nephritis occurred earlier than is usual in scarlet fever. From a rather large experience in acute nephritis I think it is fair to assume that death would not have resulted if the infant had been normal. The absence of nervous symptoms with subsidence of the anasarca, increased excretion of urine, all pointed to a favorable termination.

2. The polycythemia. This is the second patient with congenital heart disease in whom I have found polycythemia. I have had the current literature for the last three years carefully reviewed without finding anything on the blood in infants with congenital heart disease. There are valuable contributions on the blood in scarlet fever and whooping-cough, but very little on the blood of infants. It seems reasonable to presume that polycythemia is physiologic in these cases; as the individual cell carries less oxygen, an increase in the number would carry relatively more oxygen. This would seem a reasonable hypothesis.

Brandeis Building.

ABSTRACT OF DISCUSSION

DR. JOHN ZAHORSKY, St. Louis: Several years ago I reported a case of polycythemia before the St. Louis Pediatric Society, in which the red cells numbered more than eight million. At that time I looked up the subject, and I am sure I found a condition described in which children with congenital heart disease showed an enormous number of red cells.

DR. C. F. WAHRER, Fort Madison, Iowa: Is any mention made in the literature that this polycythemia is compensatory?

DR. H. LOWENBURG, Philadelphia: That polycythemia is a symptom of congenital heart disease is true, but it is not pathognomonic. I recall a case in which the count was about eight or nine million and in which there was clubbing of the fingers and a murmur. This child died rather suddenly and came to necropsy. The heart was found to be normal, but there was a marked chronic interstitial pneumonia. My

diagnosis was based largely on the murmur, clubbing of the fingers, dyspnea and polycythemia. I was wrong. The physical signs of interstitial pneumonia were lacking.

DR. H. M. MCCLANAHAN, Omaha: I have looked in the archives for ten years and have found no literature on this subject. All patients with congenital heart disease whom I have ever seen ultimately die of some intercurrent affection. I have had one live to be 16, the oldest patient of whom I have any knowledge. These patients are especially prone to acute infections, and, if they have even a mild infection, it is most likely to prove fatal.

THE NATURE OF ILEOCOLITIS FROM AN ETIOLOGIC POINT OF VIEW*

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The term "ileocolitis," while originally a pathologic designation, has become distinctly clinical. No one, I think, will assert that all cases which show the clinical manifestations of ileocolitis are necessarily combined with the pathologic lesions which the term implies, and certainly not with the severe pathologic lesions which are commonly associated with it. It seems to me that the term ileocolitis conveys to the mind of most persons the clinical picture which follows in from twenty-four to forty-eight hours the acute stage of intoxication of alimentary origin. This period represents a symptom-complex which is more or less regular. The stools, while not so frequent as during the acute stage, contain much mucus and often blood. The temperature ranges usually between 99 and 101 F., prostration is great and the tolerance for food is markedly reduced.

It is this stage of acute attacks of summer diarrhea which offer so much difficulty in the solution of the problem and its cause. In general, three or four processes have been mentioned as possible causes of this condition.

The first is bacterial infection, which has received the greatest prominence at the hands of American pediatricians. "Bacterial infection" here does not mean the intoxication produced by decomposition products, the result of bacterial action on ingested food or its derivatives, but direct infection of the system through the intestinal wall. In this connection, two organisms have been more prominently mentioned, the *Bacillus dysentericus* of the Flexner type, and the streptococcus, and in by no means all of the cases are these two organisms found.

In order to explain the condition as a result of bacterial infection, it has been necessary to resort in some cases to the expedient of assuming that the *Bacillus coli* suddenly becomes pathogenic and causes the symptom-complex which is known as ileocolitis. No one, I think, will deny that no one organism is found in all these cases, nor that exactly the same clinical picture is produced regardless of the organism found in the gastro-intestinal tract. One should make the exception here of certain epidemics which have been reported from time to time, such as those caused by the Shiga bacillus, *B. pyocyaneus*, etc.

The chief reason for claiming pathogenicity for these organisms has been agglutination reactions in the blood. Whether agglutination can be regarded as direct evidence of the pathogenicity of that organism for a patient from whom the blood was obtained seems to me rather doubtful, since we know that such organisms as *B. coli* are agglutinated by normal blood in dilutions as high as 1 to 50. The mere presence of organisms of a doubtful pathogenicity in the feces and intestines of a child sick with ileocolitis certainly cannot be regarded as direct proof of the pathogenic action of these bacteria in a given case, and much more evidence must be brought to prove any such proposition.

The second process also has to do with bacteria, but in a decidedly different manner. In this process the bacteria act as agents decomposing the bowel content—more likely the proteid content of the bowel. The decomposition product thus formed would be regarded as toxic, and such product would produce this condition.

The theory of Kendall is certainly an ingenious one and deserving of our closest consideration. His clinical results, however, are not convincing and it is possible that his failure to obtain altogether satisfactory results may be explained by the fact that the bacteria producing the toxins continue their action below the point where the sugars are ordinarily absorbed and hence have the protein content of the bowel for the medium in which to grow. It should also be borne in mind when speaking of the protein content of the bowel that in the lower bowel this is composed in only a small part, if at all, of the proteid of the food, and there is no reason to think that the decomposition of the mucus produced in the bowel may not be carried on by the intestinal bacteria to as great a degree as is decomposition of the proteid. In this way it is easily conceivable that carbohydrates may increase the proteid content of the lower bowel.

Recent experiments have shown that volatile fatty acids, the product of fat and sugar decomposition, may be distinctly irritating to the intestinal mucosa, one result of which would be the production of mucus.

The third process is that of a metabolic disturbance produced by absorption, either of too great quantities of normal elements, or of elements which, as absorption products, may be regarded as abnormal. The chief advocate of this idea is Finkelstein, and his opinion, in part, is based on the fact that oral or subcutaneous administration of sodium salts or of sugar will produce a rise in temperature. Within the past year the experiments of Samelson, Bendix and Meigs have tended to disprove this theory. They were unable to produce a rise in temperature with sodium chlorid and sugar solutions made up from freshly distilled water. In other words, freshly distilled water did not contain some element which was present in the distilled water which had stood for some time, and this element, at present unknown, was responsible for the production of fever. It might be stated that this element in all probability does not consist of bacterial bodies.

While it has not been possible to produce rises in temperature with the salts and sugars when administered subcutaneously, it has never been disproved that salts and sugars when taken by mouth will produce such rises in temperature, but we must remember that in this case the proposition is an entirely different one. Here the sugars and salts traverse the alimentary canal and are subject to the action of the intestinal ferments and bacteria. It may be that in this instance only more favorable mediums for the growth of intestinal bacteria and the production of toxins are produced. Whatever may be the cause of the fever in this instance, one cannot feel the same security in ascribing to the salts and sugars the metabolic action which many of us have regarded as the potent cause of summer diarrhea.

* Read in the Section on Diseases of Children of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

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The fourth cause which may enter into this, but which probably affects rather the initial stage than the more chronic process, is heat. Just what position heat takes as an etiologic factor in summer diarrhea is by no means definitely determined. It seems reasonably certain that some cases of intoxication are really cases of heat-stroke, but further than this it is impossible to go at the present time.

It seems to me that in the present state of our knowledge it is impossible to decide definitely between these various processes, nor is it possible to assert whether or not the condition is due to the absorption of endotoxins of various bacteria unchanged through the intestinal wall. The fact that the clinical picture does not depend on the type of bacteria found in the intestinal content speaks strongly, to my mind, against the assumption of bacterial infection as a cause of the condition.

The disturbed metabolism as produced by the absorption of sugar unchanged through the intestinal wall is, in light of recent experiments, of rather doubtful value. A more convincing proof will have to be brought forward before it can be accepted as a cause of the condition.

This leaves us with little more than a theory, a theory championed most ably by Czerny and Keller in the discussion of the nature of "toxicosis," a theory which has little to support it in the way of experiments, but against which, at the same time, few objections can be raised.

I am disregarding heat because it certainly cannot be regarded as a prime factor in the later stages of ileocolitis. In considering the condition as an intoxication produced either by absorption of endotoxins or of decomposition products of bacterial metabolism, one must take more account than has been done in the past of the intestinal mucus as a medium for bacterial growth and the source of decomposition products. Theoretically, at least, it would seem that any factor which tends to increase the flow of the mucus, whether in the small or the large bowel, should, if possible, be eliminated.

Perhaps of all the foodstuffs the protein is least irritating and the easiest of absorption, and for this reason, if for no other, it would seem that when food is to be given to infants suffering with ileocolitis, a properly dosed protein food should be the first selection.

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ABSTRACT OF DISCUSSION

DR. R. M. SMITH, Boston: I am not yet convinced that bacteria do not play a part in the etiology of ileocolitis. I saw a large part of the clinical work on which Kendall based his conclusions. I feel sure that there is truth in his contention that different types of bacteria contribute to the variety of forms of ileocolitis. The different response to different forms of treatment seem to me significant. The response is such as we would expect to receive if different bacteria played a part in the etiology. To illustrate, the cases of the group in which we are in the habit of assigning the dysentery bacillus as a cause respond favorably to the feeding of carbohydrates. We use sugar solution for this feeding. On the other hand, cases of ileocolitis in which the gas bacillus is the etiologic factor do badly when fed with carbohydrates, but do well when fed on a high protein diet. When the food furnished the individual is unfavorable for the development of the particular bacilli present, improvement in the patient is noticed. It seems to me that this different response to different treatment on the basis of a possible difference in bacterial etiology must be considered in this discussion.

DR. E. W. MITCHELL, Cincinnati: We should go away with a mistaken idea if we were to understand that bacteria did not play an important part in intestinal diseases. From the clinical side we have abundant evidence of the great importance of clean milk. By that I mean milk which has a low bacterial count. In my own city there has been an enormous change in the number of cases of sickness in babies in the summer time. I remember well when we attributed ileocolitis and other forms of intestinal trouble to the heat of the summer. Our summers have not changed in temperature; our hygienic conditions have changed for the better; people have learned much about the care of infants, but most important of all, there has been an enormous improvement in the cleanliness of our milk-supply. Those infants whom we feed throughout the summer on certified milk seldom show intestinal disturbance if they have ordinarily good care and if the milk is properly cared for at home. The remarks of Dr. Grulee are exceedingly suggestive as to the probable explanation of those cases which occasionally occur in children receiving a pure milk or children on the breast, and his explanation of why Finkelstein's theory would work out is suggestive. We all have had the experience that when we do use a fat-free milk we have far better results in the prevention of intestinal disturbances and in their more rapid cure. Perhaps Dr. Grulee also suggested a reason for this. In cases of intestinal intoxication it has been the fashion to give white of egg or albumin-water, with sometimes the result of symptoms suggestive of albumin poisoning.

DR. J. L. MORSE, Boston: I feel, as Dr. Smith has said, that our experience in Boston shows that different cases respond differently to treatment. What cures one patient will not cure another. On that basis we do feel that the bacterial etiology is important. It seems to me impossible to draw any absolute conclusions at present because our evidence is not as yet absolute. There is evidence on all sides. How to evaluate that evidence and what conclusions to draw from it has to be a good deal a matter of individual judgment and individual experience. I cannot quite agree with Dr. Grulee that the bacteria do not play an important part.

DR. CLIFFORD C. GRULEE, Chicago: I did not say that bacteria do not play an important part in summer diarrhea. What I did say was that I do not believe that specific bacteria play an important part in summer diarrhea. The bacteria which are frequently accredited with being the cause of summer diarrhea, and especially the dysentery bacillus of the type ordinarily found — that is, the Flexner type, not the Shiga — has not been shown to be especially pathogenic. So far as I have been able to determine there have been a few experiments which have shown the pathogenicity of this bacillus to animals. The antidysenteric serum has proved a flat failure in the treatment of summer diarrhea of infants. The differences in opinion among Dr. Morse, Dr. Smith and myself are differences based on clinical results which cannot be eradicated unless we see the same set of cases. Other men have taken up the work of Dr. Kendall, and I think that I am fairly familiar with that work. I have heard him explain it himself. Others have had no results from the giving of sugar in cases of dysentery. One man followed this out clinically and did not get the results that had been reported by Kendall. This is easily explained. One can never obtain as good results with a certain method as the originator of that method obtains. In the present state of our knowledge the only evidence of any value that we have for any specific bacterial cause for summer diarrhea comes from the work of Kendall, which is based on the clinical results obtained from different methods of feeding. As yet these results can scarcely be regarded as conclusive evidence.

Importance of the Dispensary.—In view of the vast field that it is called on to cover and the importance of its work, it is a curious fact that the dispensary is looked on almost invariably by boards of managers as the Cinderella of the hospital household. It is scarcely ever cared for properly, is seldom well equipped, and is almost always expected to be self-supporting.—Corwin and Mayo, in *The Outlook*.

ISOLATION OF THE TYPHOID BACILLUS FROM MILK WHICH CAUSED A TYPHOID OUTBREAK *

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The isolation of the typhoid bacillus from the milk during a milk-borne outbreak of typhoid fever is mainly of interest from the point of view of the general epidemiology of this disease. These findings merely add corroborative details to the well-established fact that milk at times serves as the medium of conveyance for typhoid to various groups of individuals.

The detection of this organism in milk also suggests the adoption of some technical method for the isolation of the typhoid bacillus from this fluid. Such a method, even when perfected, would never be used for the routine examination of market milk. It might, however, be of service in corroborating epidemiologic data in a suspected milk epidemic.

It would not be fitting in this paper to refer to the various milk epidemics of typhoid fever which have been recorded, but reference should be made to the rare cases in which the typhoid bacillus has actually been isolated from milk.

One of the first recorded instances of the isolation of the typhoid bacillus from milk was reported by Konradi,[1] who found this organism in two out of thirty-three samples examined during an outbreak at Kolozsvar. One of these samples was obtained from a bake-shop from which many of the cases originated, and the other sample was obtained from a dairy in which the farmer's son who was milking the cows had a mild attack of ambulatory typhoid fever.

The typhoid bacillus was also obtained by Shoemaker[2] from a specimen of milk which had caused eleven cases of typhoid fever. The various methods used for the identification of the organism are not stated in the article.

EPIDEMIOLOGY

The outbreak of typhoid in which the typhoid bacillus was obtained from the milk occurred in a suburban town in Maryland having 2,500 inhabitants.

In the latter part of July, 1912, 4 cases were noted, and these were followed by 23 cases in August, 19 cases in September and 10 in October, making 56 cases in all. Only 4 deaths occurred. Of the patients 26 were males and 30 were females; 49 were white and 7 were colored. Their ages ranged from 2 to 53 years, the greater number of cases, 5 in each instance, occurring at the age of 12, 17 and 22 years. But ten of the cases occurred in persons beyond 25 years of age.

The usual rate of attack of this town, computed from the years 1909 to 1911, inclusive, gave an average of 15.6 cases of typhoid fever during the four months of July, August, September and October, and, when this is compared to the larger number of 56 cases during the four months of July, August, September and October of 1912, it can be seen that this is an unusual condition, amounting to an outbreak of the disease.

As soon as the unusual number of cases for this town was noted by the State Board of Health, an investigation was begun, and water was soon excluded as a cause, since many of the patients used filtered water, furnished by a water company, which was found to have a very low bacterial count and to contain no colon bacilli. Many hundreds of persons in other towns and villages also used the water at the same time without showing an undue number of typhoid cases. The raw foods were also soon excluded, and it soon became evident that the milk of a certain milkman was the only common food which had been used by most of the victims of the disease.

On inquiry it was found that there were five milkmen serving milk to the citizens of the town and that the four milkmen who served approximately a thousand persons had only six cases on their routes, while the milkman from whose milk the typhoid bacillus was isolated and who served about fifteen hundred persons with milk had about fifty of the cases on his route.

A further investigation disclosed the fact that a woman in the dairy had suffered from typhoid fever two years previously, and that she had been handling the milk and dispensing it to customers. A specimen of the stools and urine was obtained, and from the former a typical typhoid bacillus was isolated. The feces were incubated for twenty-four hours in Conradi's bile-medium and then plated out in the Stokes-Hachtel[3] modified Hesse's medium. Typical concentric pink colonies were obtained, and when these were transferred to culture materials they conformed in all respects to the typhoid bacillus. These organisms were also agglutinated by known typhoid blood and typhoid immune serum, and the fact was thus established that a carrier had been working in the dairy. It was impossible to learn how long before the epidemic this woman had been handling the milk, but she was said to have taken a long rest after her convalescence from typhoid.

Owing to the large number of cases of typhoid fever occurring on the suspected milk route, five samples of milk were secured from the dairy and a thorough examination made for the typhoid bacillus.

TECHNIC

Each bottle of milk was thoroughly shaken and 10 c.c. inoculated into fermentation tubes containing lactose bile. At the end of twenty-four hours plates were made from these tubes on litmus-lactose agar and on the Stokes-Hachtel modified Hesse's medium. After incubation, colonies having the characteristics of the typhoid bacillus on these mediums were fished from the plates and inoculated into fermentation tubes containing dextrose bouillon. In all, about fifty colonies were fished from the various plates. The dextrose broth cultures were incubated for forty-eight hours, at the end of which time all tubes that showed the production of gas were discarded. Those cultures that did not produce gas were stained by Gram's method, and all Gram-positive organisms were next weeded out. The remaining cultures were inoculated on slant-agar, potato, blood-serum, and into litmus milk, stab-gelatin, bouillon and Dunham's peptone solution.

After hanging drops had been studied for motility, and the morphology and cultural characteristics of all the remaining cultures had been observed, only three were sufficiently striking in their characteristics as to be worthy of further study. These were Cultures 5, 9 and

* From the Bacteriological Laboratory of the State and City Departments of Health, Baltimore.

* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. Konradi: Centralbl. f. Bakteriol., 1905, Part 1, xl, 31.

2. Shoemaker, John V.: Endemic Typhoid Fever from Infected Milk, THE JOURNAL A. M. A., May 25, 1907, p. 1748.

3. Stokes, W. R., and Hachtel, F. W.: The Control of Typhoid Fever in City and Country, with a Description of a Modified Hesse's Medium for the Detection of the Typhoid Bacillus in Excreta and Fl'd Foods, Arch. Int. Med., August, 1910, p. 121.

24. These three bacteria were morphologically and culturally like *Bacillus typhosus*. Repeated attempts, however, to secure agglutination with Organism 5 with typhoid immune serum at very low dilutions and with a number of known positive typhoid bloods were futile, and Culture 24 after about ten days developed a fluorescence, and both these organisms were also put aside. Culture 9, however, resembled *Bacillus typhosus* so closely in all its features that a careful study was made of it, which we shall describe in detail.

Morphology and Staining.—The organisms under the microscope appeared as straight rods with rounded ends, occurring singly, from about 1 to 3 microns in length by from 0.4 to 0.7 micron in width. They stained readily by the ordinary anilin dyes, were decolorized by Gram's method and contained no spores. Young agar and bouillon cultures were actively motile.

Cultural Characteristics.—The growth appeared on agar-slants as a uniform layer of translucent grayish-white growth. Bouillon showed a uniform turbidity. Gelatin stab-cultures were not liquefied at the end of six days at 37 C. (98.6 F.). Litmus-milk showed very slight acidity at the end of twenty-four and forty-eight hours and six days. There was no coagulation. On potato the growth was visible only as a slight glistening moisture. No indol formed in Dunham's peptone solution. Blood-serum contained a uniform growth, the color of the medium. There was no liquefaction.

Agglutination Tests.—Agglutination tests were first made with ten known positive typhoid bloods at a dilution of about 1: 50. The tests were controlled by making similar tests at the same time with Laboratory Stock Culture 4. The results are shown in Table 1.

TABLE 1.—RESULTS OF AGGLUTINATION TESTS MADE WITH POSITIVE TYPHOID BLOODS—DILUTION 1:50

Typhoid Bloods No.	Culture 9 from Milk 24-Hour Bouillon Agglutination	Culture 9 from Milk 24-Hour Bouillon Motility	Laboratory Stock Culture 4, 24-Hour Bouillon Agglutination	Laboratory Stock Culture 4, 24-Hour Bouillon Motility
Controls no serum ..	0	+	0	+
1	+	0	+	0
2	+	0	+	0
3	+	+*	+	0
4	+	0	+	0
5	+	0	+	0
6	+	0	+	0
7	+	0	+	0
8	0	+	+	0
9	+	0	+	0
10	+	+*	+	0

* Slight.

It will be seen from the above table that Culture 9 from milk was agglutinated by nine out of ten positive typhoid bloods, although in two instances there was still slight motility present when the specimens were examined at the end of two hours.

A comparative agglutination test was next made with typhoid immune serum, laboratory stock typhoid bacillus being used as a control. The results are shown in Table 2.

TABLE 2.—RESULTS OF AGGLUTINATION TEST WITH TYPHOID IMMUNE SERUM

Dilution of Serum	Culture 9 from Milk 24-Hour Bouillon Agglutination	Culture 9 from Milk 24-Hour Bouillon Motility	Laboratory Stock Culture 4, 24-Hour Bouillon Agglutination	Laboratory Stock Culture 4, 24-Hour Bouillon Motility
Controls no serum ..	0	+	0	+
1:10	+	0	+	0
1:20	+	0	+	0
1:40	+	0	+	0
1:80	+	0	+	0
1:160	+	0	+	0
1:320	+	0	+	0
1:640	+*	0	+	0
1:2,560	0	+	0	+

* Incomplete.

A rabbit was immunized with a vaccine made from Organism 9, from milk, by injecting six doses, the first two of 500 million, the third of 1,000 million, and the last three 4,000 million dead organisms at intervals of ten days between doses.

Agglutination tests were made with serum obtained from this rabbit and twenty-four-hour cultures of Organism 9, from milk, Laboratory Stock Typhoid Culture 4, paratyphoid bacillus (alpha) and paratyphoid bacillus (beta), with the results tabulated in Table 3.

TABLE 3.—RESULTS OF AGGLUTINATION TESTS MADE WITH SERUM OBTAINED FROM IMMUNIZED RABBIT AND VARIOUS CULTURES

Dilution of Rabbit-Serum	Culture 9 Ag.	Culture 9 Mot.	Culture 4 Ag.	Culture 4 Mot.	Paratyphoid (Alpha) Ag.	Paratyphoid (Alpha) Mot.	Paratyphoid (Beta) Ag.	Paratyphoid (Beta) Mot.
Serums ..	0	+	0	+	0	+	0	+
1:20	+	0	+	0	+	0	+	0
1:40	+	0	+	0	++	+	+	0
1:80	+	0	+	0	++	+	0	0
1:160	+	0	+	0	0	+	0	0
1:320	+	0	+	0	0	+	0	+
1:640	+	0	+	0	0	+	0	+
1:1,280 ...	+	0	+	0	0	+	0	+
1:2,560 ...	+	0	+*	0	0	+	0	+
1:5,120 ...	0	0	0	0	0	+	0	+
1:10,240 ..	0	0	0	0	0	+	0	+

* Slight.

The table shows that the serum obtained from the rabbit immunized with Typhoid Bacillus 9 from milk is capable of agglutinizing Laboratory Stock Typhoid 4 at very high dilutions. It also agglutinates both alpha and beta paratyphoid at low dilutions.

Absorption tests were next made by saturating a portion of the serum obtained by immunizing a rabbit with Culture 9 from milk with cultures from Laboratory Stock 4 and Milk Cultures 9. Agglutination tests were made with the serum saturated with Culture 4, with the twenty-four-hour bouillon cultures of both Culture 4 and Culture 9. No agglutination was obtained at a dilution at 1: 20 (lower dilutions were not made). Likewise the serum saturated with Culture 9 was tested for its agglutinative properties by both organisms with like results.

Complement-fixation tests were next made with the serum obtained from the rabbit immunized against Organism 9 from milk, using Laboratory Typhoid Culture 4 as antigen in one set of experiments and Milk Culture 9 as antigen in the second experiment. Complete fixation of complement occurred with Organism 9 from milk with 0.05 c.c. of serum. In the experiment in which Organism 4 was used complete fixation occurred with 0.025 c.c. of the serum.

The bactericidal activity of the serum obtained from the rabbit immunized against Culture 9 from milk was determined for both Organisms 4 from stock and Organism 9 from milk. The experiments were made *in vitro*, according to the method originally devised by Neisser and Wechberg. The results of the experiments are given in Table 4.

TABLE 4.—RESULTS OF COMPLEMENT-FIXATION TESTS MADE WITH SERUM OBTAINED FROM IMMUNIZED RABBIT AND VARIOUS CULTURES

Dilution of Serum	No. of Organisms on Plates Made with Culture 9	No. of Organisms on Plates Made with Culture 4
Undiluted	15,600	4,200
1:2	7,200	8,700
1:4	1,000	3,600
1:8	60	1,800
1:16	0	1,400
1:32	4	600
1:64	2	0
1:128	2	15
1:256	15	5
1:512	1	8
1:1,024	8	300
1:2,048	1,230	900
1:4,096	7,680	3,000
1:8,192	9,600	2,400
1:16,384	5,400	3,000
1:32,768	78,000	3,000

The number of Organisms 9 seeded into each tube, as shown by Control Tube 1, which was not incubated, was 11,000. The number or organisms in Control 2 which was incubated three hours was 60,000. The complement control plate contained 2,000 bacteria.

The number of Organisms 4 seeded into each tube, as shown by Control Tube 1, was 10,000. Control 2, which was incubated for three hours, contained 96,000 organisms, and Complement Control 3 contained 8,500 bacteria.

SUMMARY OF THE SEROLOGIC TESTS

The first set of agglutination tests described in Table 1 shows that the organism obtained from milk would agglutinate with a number of different samples of known typhoid blood, and the tests described in Table 2 show that this organism would also agglutinate in comparatively high dilutions with an immune serum made from a known typhoid bacillus. The agglutination tests described in Table 3 show that a serum prepared by injecting an animal with the organism obtained from milk will agglutinate a known typhoid bacillus in nearly as high a dilution as that obtained with the milk organism itself. This table also shows the phenomenon known as the "group" agglutination, since it can be seen that the milk typhoid serum will agglutinate both the alpha and beta paratyphoid bacilli in low dilutions.

The absorption tests made by saturating the serum of the animal immunized with the culture obtained from the milk show that the antigen prepared from the typhoid bacillus obtained from milk is capable of binding all of the typhoid agglutinogen or receptors with which the agglutinin combines. When these receptors had combined with all of the agglutinin in the blood-serum, this serum was no longer able to produce agglutination of a known typhoid bacillus or of the suspected typhoid bacillus obtained from the milk.

The same experiment was performed by using a known typhoid bacillus as the antigen, and all of the agglutinin was again abstracted from the immune serum made from the milk typhoid bacillus.

The complement-fixation tests also show that the antigen made from the typhoid bacillus obtained from the milk, as well as from a known laboratory typhoid bacillus, was able to produce complete complement-fixation by combining with the amboceptor in the immune serum made from the milk typhoid bacillus.

The bactericidal tests described in Table 4 show that the amboceptor contained in the immune serum made from the milk typhoid bacillus is able to bind the complement to known typhoid bacilli as well as to the milk organism, producing marked bacteriolysis in the dilutions, which are set forth in the table. The failure of the lower dilutions to destroy the typhoid bacillus in both cases corresponds to the phenomenon already described by Ehrlich and known as the "Neisser-Wechberg phenomenon." In this reaction when an excessive amount of amboceptor is used the complement is not bound to all of the typhoid bacilli, and these escape destruction and later multiply rapidly.

These experiments, therefore, show that the antigen of the milk typhoid and the antigen of the known laboratory typhoid bacillus correspond in all of their sero logic characteristics and completely confirm the cultural tests, which are all characteristic of a typical typhoid bacillus.

PATHOGENIC PROPERTIES

In order to test the pathogenic properties of the typhoid bacillus isolated from milk the organism was injected into the peritoneal cavity of three guinea-pigs. A quantity equivalent to about 4,000 million live typhoid organisms from a twenty-four-hour growth on blood-serum was used for injecting each animal. It is a well-known fact that the typhoid bacillus is often variable in its effect on animals, and this organism did not prove to be very virulent. Two of the guinea-pigs recovered from this injection, but the third animal died in twenty-four hours, and the necropsy showed an extensive fibro-purulent peritonitis. Cover-slips from this exudate showed nothing but Gram-negative, typhoid-like bacilli and a few pus-cells. Cultures from the peritoneal cavity, the liver and the spleen showed numerous colonies of the typhoid bacillus. The injection in this one animal, therefore, produced purulent peritonitis and a general bacteriemia, thus showing that the organism was pathogenic.

METHODS USED TO CONTROL THE EPIDEMIC

After the discovery of the carrier case in the dairy the place was closed, September 28, and in about ten days from this time the epidemic had practically ceased. It should not be thought, however, that this result was entirely due to this one act, since an investigation of the water-supply of a certain percentage of the citizens showed a most remarkable condition of affairs. These persons obtained their drinking-water not from the water company furnishing pure water, but from shallow or deep wells, almost all of which were polluted either by adjoining cesspits or box toilets.

A large number of chemical and bacteriologic examinations of water were made and almost all of the wells were found polluted, either bacteriologically or chemically. These examinations were made from September 25 to October 21, inclusive, and it can be seen that the epidemic had then already been under way for two months. Owing to this reason it is very difficult actually to separate the water-borne from the milk-borne cases; but the almost exclusive distribution of the cases to one milk-route would seem to indicate that the typhoid bacilli from these cases had not penetrated the soil to a sufficient extent to actually introduce typhoid bacilli into many of the drinking-wells.

After having discovered the remarkable condition of saturation of the subsoil with the seepage from the cesspits it was determined to disinfect these pits by calcium hypochlorite. It was found that there were two hundred cesspits in this small town, and about 20 pounds of calcium hypochlorite were added to each one of these pits. The pools and gutters in the town and on the outskirts were also disinfected.

It is impossible to say whether or not this disinfection had its share in stopping the outbreak, but it seems reasonable to believe, from the results of the chemical and bacteriologic examinations, that there must have been fairly constant communication between the polluted material in the pits and the drinking-water from many of the wells. At least, the epidemic practically ceased after the first week in October, and the removal of the carrier case from the dairy, as well as thorough disinfection of the cesspits, can both be regarded as having aided in preventing the further spread of the disease. The handles were removed from most of the pumps connected with these drinking-wells, and this also had its effect in preventing the further spread of infection.

SUMMARY

1. The first point of interest in this study consists in the isolation of a typical typhoid bacillus from the milk which caused a milk-borne outbreak of typhoid fever.

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2. The study is also of interest as demonstrating the relation of infected milk to the epidemiology of typhoid, and contains the methods by which the cause of the outbreak was recognized and by which its further spread was averted.

We are indebted to Drs. Frederic V. Beitler, C. W. G. Rohrer and W. B. D. Penniman for much information and aid in preparing this paper.

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THE TREATMENT OF DIPHTHERIA CARRIERS *

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In this paper I shall consider the treatment of diphtheria carriers with the idea of ridding them of the specific germs. The paper will not comprehend the treatment of the diphtheria patient nor will it deal with the problem of isolating or otherwise protecting others from the carrier.[1]

The necessity for the treatment of carriers with the idea of getting rid of the diphtheria bacilli is obvious when we consider the frequency of the carrier condition and the length of time that the condition often continues. After the clinical symptoms of the disease have disappeared, the patient is ready to be released from quarantine, but the interests of the public health demand that he shall not mingle with the general public while he still carries the germs of the disease.

NUMBER OF DIPHTHERIA CARRIERS

According to Ledingham,[2] 50 per cent. of persons affected by diphtheria have lost the bacilli by the time the local membrane has disappeared. Of those harboring diphtheria bacilli after the throat had become healthy in appearance, Scheller[3] found that 77 per cent. still had the bacilli at the end of eleven days after the throat had become normal in appearance; 35 per cent. at the end of twenty-one days; 18 per cent. at the end of thirty-one days; 5 per cent. at the end of two months, and 2 per cent. at the end of three months. Considering that these figures apply only to the 50 per cent. of patients who still have diphtheria bacilli after the throat has become clear, it means that if we took as a basis the total number of cases of diphtheria, the percentage figures would be only one-half those given. My own figures are slightly different.[4] I found that of all cases of diphtheria, 41 per cent. were free from diphtheria bacilli by the end of the second week after the beginning of the disease; 73 per cent. at the end of the third week, and 99 per cent. at the end of the fourth week.

Of the general population who have not been affected by the disease, 1 or 2 per cent., under ordinary conditions, and from 5 to 10 per cent. during epidemics of the disease are "carriers" of the germs. They retain the bacilli for about the same length of time, on an average, as convalescents from the disease.

VIRULENCE OF BACILLI IN CARRIERS

The virulence of the diphtheria bacilli seems to be but slightly lessened during the carrier condition even though the condition persists for a long time and is completely lost (as determined by the ordinary tests) in only a small proportion of the cases. It is therefore quite obvious that with but few exceptions a carrier can transmit the disease as long as the carrier condition remains. It is also probable that the carriers are responsible for more cases of the disease than are those affected by the disease itself. This certainly seems to be the case if we include among the carriers those with slight evidence of local inflammation, but presenting no obvious general symptoms and whose condition is not diagnosed clinically as diphtheria.

LOCATION OF THE BACILLI IN THE CARRIER

In general we may say that the nose and throat are the places in which the diphtheria bacilli are to be found. On that basis, the release from quarantine for diphtheria is based, almost the country over, on negative findings of swabbings from the nose and throat. Swabbings taken from both and cultivated separately indicate that, when dealing with well persons, the bacilli are found more frequently in the nose than in the throat.[5] These findings are the results of surface swabbing. The result will probably be different, if the swab, instead of being used on the surface of the tonsils, is introduced into the crypts of those structures.

It seems improbable that the diphtheria bacilli will remain and continue to grow for any great length of time on the rather smooth mucous membrane which covers the greater part of the nose and throat; rather do I believe that their home is in little pockets here and there from which there is not a sufficient stream of mucus to dislodge them. Such pockets may be represented by the crypts of the tonsils, the fissures of the adenoids, the spaces about the turbinates, and the sinuses connected with the nasal cavity.

The finding by Beyer[6] of diphtheria bacilli in the urine in every one of nineteen children examined from four to fourteen weeks after they had apparently recovered from diphtheria should cause further investigations of this phase of the subject. If his report is generally confirmed, it will have an important bearing on public health, especially with reference to milk.

METHODS OF RIDDING CARRIERS OF THE BACTERIA

Many methods have been used to get rid of diphtheria bacilli. These have consisted of liquid antiseptics applied with cotton, sprayed or gargled; inhalations of antiseptic vapors; use of diphtheria vaccine, toxin, antitoxic and antibacillary serum, toxins of the *Bacillus pyocyaneus*, and finally the use of cultures of staphylococci.

1. *Use of Liquid Antiseptics Applied by Means of a Cotton Swab.*—These are applied, of course, only to the throat (tonsils and pharynx). They consist of such liquid antiseptics as a weak solution of phenol (carbolic acid), glycerin, with 3 per cent. iodin, and 5 per cent. solutions of silver nitrate. As ordinarily performed, the antiseptics are applied only to the exposed surfaces of the throat, no effort being made to get into the crypts of the tonsils. I shall refer to these later.

* Read in the Section on Preventive Medicine and Public Health of the American Medical Association, at the Sixty-Fourth Annual Session held at Minneapolis, June, 1913.

1. The principles concerned with the protection of others from the carriers are considered in an article by Albert, Henry: Diphtheria Carriers and Their Relationship to Medical Inspection of Schools. Am. Jour. Pub. Health, ii, No. 10.

2. Ledingham and Arkwright: The Carrier Problem in Infectious Diseases, 1912, p. 203.

3. Scheller: Centralbl. f. Bakteriol., Orig., 1906, xl, 1.

4. Albert, Henry: Diphtheria: A Statistical Study of Certain Laboratory and Clinical Observations, Jour. Infect. Dis., 1907, iv, 210.

5. Report on Diphtheria Bacilli in Well Persons, by a committee of the Massachusetts Association of Boards of Health, Jour. Massachusetts Assn. of Boards of Health, July, 1902.

6. Beyer, W.: Diphtheria Bacilli in the Urine, München. med. Wchnschr., 1913, lx, No. 5.

2. *Use of Liquid Antiseptics Applied by Means of a Spray.*—These may be applied to both nose and throat. The following fluids have been used with greatest success: Seiler's solution; Dobell's solution; hydrogen peroxid of 0.5 per cent. (by weight) strength. Any of these solutions are found to be too irritating for many persons.

It is probable that sprays are more efficacious than liquids applied by means of a swab in the ordinary way. Nevertheless sprays do not reach the recesses in which it is most probable that diphtheria bacilli find their hiding-places.

3. *Use of Liquid Antiseptics Applied by Means of Gargles.*—These are probably more effective for the throat than either swab applications or sprays. The liquid that has probably given the best results is hydrogen peroxid in from 0.5 to 1 per cent. strength (the ordinary commercial hydrogen peroxid solutions are of about 3 per cent. strength). Solutions of sodium chlorid and Seiler's solution have also been used. The liquid used as a gargle may also be used as a mouth-wash.

4. *Inhalations of Antiseptic Vapors.*—The following method was used by the French army, in 1910, for the disinfection of the nasopharynx: A mixture is prepared of iodin, 12 gm.; guaiacol, 2 gm.; thymol, 25 gm., and alcohol (60 per cent.) 200 c.c., to which are added .6 gm. of potassium iodid to aid in the dissolving of the iodin. This mixture is placed in a porcelain dish and the dish floated in a basin of boiling water. The person whose nasopharynx is to be disinfected should sit with head bent over and nose a few inches distant from the porcelain dish, and inhale the fumes by breathing slowly through each nostril. There should be five sittings in twenty-four hours, each sitting to last two or three minutes. I have not yet seen any statistical data of the effect of this inhalation treatment on diphtheria carriers. This and other inhalations are worthy of much more extensive trial.

5. *Diphtheria Antitoxin.*—The use of antitoxin administered either by hypodermic injection or by the dissolving of tablets in the mouth seems to have no effect in getting rid of the bacilli.

6. *Antibacillary Diphtheria Serum.*—Some good results have been reported from the use of antibacillary diphtheria serum applied locally. The evidence of its value is, however, very unsatisfactory.

7. *Diphtheria Vaccine.*—Vaccines of dead diphtheria bacilli were first used with the view of curing the carrier condition by Petruschky[7] in 1908. Five of his six cases seemed to respond favorably to the treatment. Similar results suggesting that vaccines are of some value were obtained by Hall and Williamson[8] in 1911 and by Forbes, Duncan and Newsholme[9] in 1912.

8. *Diphtheria Toxin.*—Hewlett and Nankivell[10] report a reduction in the time that diphtheria bacilli can be found in the nose and throat after an attack of the disease by the hypodermic injection of diphtheria endotoxin, beginning with a dose of 2 mg., followed at the end of a week or ten days, if necessary, with an injection of 5 mg.

9. *Staphylococcic Culture (Living) Sprayed into Nose and Throat.*—In December, 1909, Schiötz,[11] a Danish physician, described a method of freeing throats from diphtheria bacilli which seems destined to be a procedure of considerable importance. It has proved successful in about forty reported cases in which other measures failed, and so far no unfavorable results have been reported. Schiötz obtained his suggestion from the fact that a person with a staphylococcic sore throat placed in a diphtheria ward under a mistaken diagnosis did not contract diphtheria. He also found that the germs disappeared on the development of an ordinary staphylococcic sore throat, from several patients in whom, after recovery from diphtheria, the specific bacilli persisted for some time. He reported the treatment of six cases with the staphylococcic culture obtained from the throat of a healthy person. The diphtheria bacilli disappeared after one inoculation of the throat of a man who had been detained in the hospital for three months as a diphtheria carrier, and of a woman who had likewise been detained for two months. The other patients who had had diphtheria more recently recovered from the carrier condition with equal rapidity after one treatment with staphylococci. More recently Page[12] tested the method with equal success. Catlin, Scott and Day[13] tried the staphylococcus spray on carriers in connection with an epidemic of diphtheria which occurred at the Rockford (Ill.) hospital. Of seventy persons, 17 per cent. developed diphtheria and 31 per cent. became carriers. In spite of liquid antiseptic treatment, some of them continued to remain carriers for a long time, but the bacilli soon disappeared after the use of the staphylococcus spray. Lorenz and Ravenel[14] also report good results in a few cases. Alden[15] of our laboratory reports good results in fifteen out of sixteen cases. The material used was a broth-culture of the *Staphylococcus pyogenes aureus* which was originally obtained from a throat culture submitted for examination for diphtheria bacilli. The inoculated broth tube was kept in the incubator at 37 C. (98.6 F.) for eighteen hours. The treatment consisted of sprays of the living staphylococci into the nose and throat. Treatments were given once a day until the patients were free from diphtheria bacilli.

Lydia Dewitt[16] in making an experimental investigation of this method of treatment was unable to determine to what influence the good effects are due. There is apparently no antagonism between the two organisms.

Aside from the occurrence of slight negligible reactions, the literature contains no reported cases of harmful effects produced by the use of the staphylococcus spray. I desire to report one case of this kind, which occurred in the practice of Dr. J. E. Luckey of Vinton, Iowa, with a culture supplied by us. He reports:

> We used the culture of staphylococci in two cases. Our first case responded beautifully, the bacilli disappearing in a few days. The second case cleared readily of the Klebs-Loeffler bacilli, but the reaction, consisting of local inflamma-

7. Petruschky: Arb. a. d. path., Inst. z. Tübingen, 1908, vi, Part 2, p. 331.

8. Hall and Williamson: Jour. Path. and Bacteriol., 1911, xv, 350.

9. Forbes, Duncan and Newsholme: Lancet, London, 1912, i, 292.

10. Hewlett and Nankivell: Treatment of Diphtheria Infection by Means of Diphtheria Endotoxin, Lancet, London, July 20, ii, No. 4,538.

11. Schiötz: Ugeskriftet af Lægerne, Copenhagen, Dec. 16, 1909, No. 50; abstr., THE JOURNAL A. M. A., Jan. 29, 1910, p. 422.

12. Page, H.: Diphtheria Bacillus Carriers, Arch. Int. Med., January, 1911, p. 16.

13. Catlin, Scott and Day: Successful Use of the Staphylococcus Spray on Diphtheria Carriers, THE JOURNAL A. M. A., Oct. 28, 1911, p. 1452.

14. Lorenz, W. F., and Ravenel, M. P.: The Treatment of Diphtheria Carriers by Overriding with Staphylococcus Aureus, THE JOURNAL A. M. A., Aug. 31, 1912, p. 690.

15. Alden, A. M.: The Staphylococcus-Spray Treatment of Diphtheria Carriers, THE JOURNAL A. M. A., June 14, 1913, p. 1876.

16. Dewitt, Lydia: Action of Staphylococcus Aureus on the Klebs-Loeffler Bacillus, Jour. Infect. Dis., January, 1912, abstr., THE JOURNAL A. M. A., Feb. 3, 1912, p. 369.

tion with nausea, chills, high fever and rapid pulse, was so great that we desire to be excused from its use in the future.

The development of this severe condition may, of course, be a coincidence.

10. *Extirpation of the Tonsils when Markedly Enlarged and Removal of Adenoids.*—These conditions alone are indications for the operative procedures mentioned. The continuance of the diphtheria-carrier condition represents a further indication. On account of the wound produced, it is advisable to give an immunizing dose of diphtheria antitoxin before the operation, as cases of severe diphtheria in carriers following such operations have been reported.

AUTHOR'S EXPERIENCE AND EXPERIMENTS AS TO THE PRESENCE OF THE DIPHTHERIA BACILLI OF CARRIERS IN THE CRYPTS OF THE TONSILS

Discovery of the Crypts of the Tonsils as the Hiding Place of Diphtheria Bacilli.—During the spring of 1911 a number of cases of diphtheria occurred among the nurses and patients of the University Hospital at Iowa City. As it was suspected that some of the nurses or other employees of the hospital were diphtheria carriers an examination was made of the nose and throat of every employee in the hospital with the result that twenty-two of them (20 per cent. of the entire number) proved to be carriers. These were placed in isolation, the nose treated with an alkaline antiseptic spray and the throat gargled with a 1 per cent. solution of hydrogen peroxid. The desire for the inmates to be released from isolation as soon as possible caused eight of them to use a hydrogen peroxid gargle within fifteen minutes of the time that the culture was to be taken. The person who took the culture was apprised of this fact and consequently took two swabbings from each throat, one from the surface of the tonsils and pharynx and one from the crypts of the tonsils. In all but three of these cases, cultures from the surface swabbing did not contain any diphtheria bacilli, whereas, in every instance but one, cultures from the tonsillar crypts were positive. This indicated that so far as the throat is concerned, the crypts of the tonsils are the hiding-places for diphtheria bacilli.

Other Evidence Implicating the Tonsillar Crypts in Connection with the Carrier Condition.—Aside from the observation just noted, which I have noticed on a number of occasions subsequently, I may mention that:

1. The tonsils seem to be the logical place in which diphtheria bacilli should remain, in view of the fact that they are the parts most often primarily affected by diphtheria.

2. The surface being smooth and having mucus, saliva, etc., passing over it more or less constantly does not seem to be a favorable place for diphtheria bacilli to remain and multiply unless, of course, a membrane has formed. On the other hand, diphtheria bacilli or any other bacteria that have once gained entrance to the larger crypts, some of which are more than a centimeter in depth, find it a place in which they are but little disturbed, lined as these crypts are by squamous epithelium and not giving origin to any secretion or excretion to sweep the contained bacteria out, as occurs in connection with the ducts of glands.

3. Those who have had extensive experience with diphtheria-bacilli carriers report that a large proportion of them (considerably larger than among those who are not carriers) have enlarged tonsils with prominent crypt openings and deep crypts.

4. By squeezing the tonsils and forcing "plugs" of material out of the crypts, Kretschmer[17] has succeeded in freeing thirteen patients from the carrier condition on whom the more simple measures failed.

5. Treatment aimed at destroying the bacteria in the tonsillar crypts has proved successful in ridding diphtheria carriers of the contained bacteria. Although silver nitrate has long been used to treat inflammatory conditions of the throat, its use for treating diphtheria carriers whether there was naked-eye evidence of tonsillitis or not was first used, so far as I know, by Dr. L. W. Dean of Iowa City. He tried it first on the University Hospital employees in 1911. The carriers in question had been treated from three to ten days with antiseptic sprays and gargles, during which time only two of twenty-two carriers became negative. Of the remainder, fourteen had the crypts of their tonsils treated with silver nitrate. Of the cultures taken twenty-four hours later ten were negative. The remaining four became negative within three days. A number of physicians to whom I have recommended this treatment, have informed me that this method has yielded better results than any other method tried including the staphylococcic culture method (Luckey).

Method of Applying the Silver Nitrate.—A 5 or 10 per cent. solution is used and should be made up with distilled water and kept in a dark-colored bottle or a dark place to prevent deterioration. This solution is applied by means of applicators made of a metal which may be bent readily as copper and are long enough (about 11 inches) to admit of convenient handling. The end which is to be inserted into the crypts must be small (about 0.75 mm. in diameter) and roughened in order to hold cotton. Around this end is tightly wrapped a very small amount of cotton—only a few fibers, so that the cotton-wrapped applicator measures less than a millimeter in diameter. This is bent about a centimeter from the end so that the angle formed is a little more than 90 degrees. It is then dipped in the silver nitrate solution. All excess of the solution should, however, be removed by pressing the cotton against the inner side of the neck of the bottle. This is important since the excess may trickle down the throat to the glottis of the larynx where the reaction induced may prove serious. With the tongue well pressed down, the crypts should be probed preferably from below upward, since the slight amount of silver nitrate which may not enter the crypt tends to flow down and the whitening produced tends to obscure the openings of crypts below. The openings of the larger and therefore most important crypts are easily found and entered. To find the smaller ones it is often necessary to run the end of the applicator gently over the surface of the tonsil until it finds a depression. Several of the smaller ones may be probed without redipping the applicator into the nitrate solution. For the larger ones it is best to redip each time. If the cotton-wound probe is too thick, it will not readily enter the crypts. In that case the applicator without the cotton will often pass in easily. Without the cotton, however, it is impossible to introduce sufficient of the nitrate solution, unless possibly the applicator is sufficiently roughened just back of the tip to "hold" a little fluid.

The Effect of Silver Nitrate Applications.—Bacteriologic: The 5 per cent. solution of silver nitrate will destroy all bacteria with which it comes in contact. I have been unable to obtain a culture from many crypts that were thoroughly treated with silver nitrate from

17. Kretschmer, M.: Zur Bekämpfung der Bacillenpersistenz bei Diphtheriere-konvaleszenten, Med. Klin. 1911, vii, No. 3.

which I had just previously obtained cultures of the diphtheria bacillus and other organisms. This, then, is one way in which this treatment of the crypts gets rid of diphtheria bacilli.

Pathologic: The silver nitrate solution (from 10 to 40 per cent.), if thoroughly applied, will destroy the lining epithelium of the crypts. If not thoroughly applied, the deeper epithelial cells are not destroyed. In any case there is an inflammatory reaction, the degree depending on the strength and amount of the solution. I have tried solutions up to 40 per cent. Although the stronger solutions produce more destruction of tissue and are therefore better, if that is what is desired, yet the reaction induced is often too severe. I believe, therefore, that the weaker solutions (from 5 to 10 per cent.) are the better. Microscopically the reaction consists principally of a hyperemia, a leukocytic exudation and a proliferation of fibroblasts.

The pathologic changes induced are probably of benefit in two ways:

1. The destruction of the epithelium of the crypts and the accompanying fibroblastic proliferation tends, no doubt, to obliterate the lumen of the crypt, which is quite obviously desirable.

2. The greater number and activity of the leukocytes renders greater phagocytosis possible, and the hyperemia brings to the area the antitoxic, bacteriolytic and opsonic properties of the blood. It is quite probable that the good effect of staphylococcic cultures is due to the induction of a similar reaction.

Clinical: My experience has assured me that the application of a solution of silver nitrate to the crypts of the tonsils is efficacious in ridding diphtheria carriers of the specific micro-organism. I believe that its use is more efficacious and less dangerous than the use of the staphylococcic culture; in other words, I believe it to be the best single remedy which we have.

CONCLUSIONS

1. The length of time during which patients who have had diptheria continue to carry diphetheria bacilli in the nose and throat after all clinical evidence of the disease has disappeared, and the frequency with which diphtheria carriers are found among persons who have never had the disease, renders it important in the interest of both the individual and the public health to rid carriers of the specific organisms as quickly as possible.

2. It is obvious from the large number of methods proposed for the removal of diphtheria bacilli from diphtheria carriers that no one method has proved satisfactory.

3. The use of the various antiseptics, gargled or sprayed, is of doubtful value in relieving the carrier condition, although they no doubt destroy many of the germs with which they come in contact and therefore lessen the infectivity of the carrier.

4. During the past few years, good results have been obtained by myself and a number of other observers, by the use of a spray of a culture of staphylococci.

5. I have obtained my best results by the treatment of the crypts of the tonsils with a solution of silver nitrate (from 5 to 10 per cent.) applied by means of a thin flexible applicator, combined with a mild alkaline and antiseptic spray (such as Seiler's solution) for the nasal cavity, and a 1 per cent. solution of hydrogen peroxid as a mouth-wash and gargle.

6. There is great need of applying the different methods of treatment aiming at ridding diphtheria carriers of the specific micro-organisms in a well-controlled manner in a large series of cases.

7. If it is found that diphtheria bacilli are frequently found in the urine of convalescents, more attention should be given to the hygienic aspects connected with this condition.

I desire to acknowledge the courtesy of Dr. L. W. Dean of Iowa City in supplying me with tonsils treated with solutions of silver nitrate of different strength at varying lengths of time preceding their removal.

ABSTRACT OF DISCUSSION

DR. L. L. TEN BROECK, Minneapolis: The application of antiseptics to tonsillar crypts is an advancement over methods previously employed; it is also an acknowledgment of its shortcomings, to wit, the difficulty of controlling the entire infected area. Reports based on cultural control alone may be misleading, since the areas accessible to culture are necessarily limited to areas accessible to antiseptic application. It is the inacessible areas and crypts that justify such methods as those of Scholtz (staphylococcus) or Emmerich (pyocyanase). The use of facultative pathogens, especially on raw surfaces in acute stages, is open to criticism, for postdiphtheritic staphylococcus infiltrations are not unknown. Furthermore, the bactericidal action of an organism is not demonstrated by spraying it copiously on a diphtheritic field, even if culture on mediums supporting well the growth of the sprayed organism subsequently fails to develop colonies of *Bacillus diphtheriae*. To illustrate, Dr. Corbett, city bacteriologist, found nothing but streptococci in a postdiphtheritic otitis medium. Dilute phenol irrigations, however, inhibited this growth and permitted pure cultures of *B. diphtheriae*. Subsequent mixed inoculations gave streptococci only. Given a medium supporting the *B. diphtheriae*, and not its antagonist, grow the two together on mediums suitable to both and one has an absolute test of the bactericidal properties of the antagonist. For example, here is a broth culture (exhibiting the same) of *B. diphtheriae* to which on the second day were added a thallophytic fungus (genus *Saprolegnia*) and human blood (since the fungus grows only on human blood so far as ordinary culture mediums are concerned, not on Loeffler's mediums.) Subcultures the third day on Loeffler's, likewise the fourth day (that is, from the inoculation with *B. diphtheriae*) are negative as you see in these tubes. Clinical tests have been made on normal throats, in twenty-five cases of follicular tonsillitis and in fifty cases of membranous tonsillitis without complications traceable to the fungus and with disappearance of the diphtheria germ in about seventy-two hours in cases controlled bacteriologically. A few patients have made a clinical and bacteriologic recovery following inoculation with the fungus alone without other medication. This (exhibiting specimen) is a diphtheritic cast of a uvula removed without recurrence sixty-eight hours after diagnosis and inoculation with the fungus, cultures remaining positive for three days only. Four membranes have been removed from four diphtheritic patients and inoculated on normal throats about twelve hours after use of fungus on patients. A slight faucial congestion negative for diphtheria was all that was noted, the thallophyte apparently growing to the exclusion of other contagion. Perhaps it will be possible to compel the patient to transmit the prevention as well as the contagion even at this early stage. The dispensing is simple —a powder, kept in vials, consisting of spores lactose (a diluent) and blood on which it is grown and from which it is filtered. These statements are based on results that are at present undergoing critical review in the University of Minnesota. A report will be forthcoming as soon as they are substantiated.

DR. HENRY ALBERT, Iowa City, Iowa: Were cultures made after forty-eight hours following the use of the spores?

DR. L. L. TEN BROECK, Minneapolis: Yes; cultures were made up to four days. The test has been repeated with a number of strains.

DR. HAROLD B. WOOD, Rochester, Minn.: Just because the diphtheria bacilli finally give way to staphylococci in the

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throat is no specific reason why only the staphylococci themselves should be used as overriders. After Ravenel put that theoretic transference into the practical experience of using the staphylococci as overriders to eliminate the diphtheria bacilli, all or practically all the experimenters seemed to be using the same organism. That organism is well known to be a facultative pathogen. Some other organism which cannot damage the human body would perhaps be the more ideal organism to use in overriding.

I have one report which is so brief that no conclusions can be drawn from it; however, it may be of interest. At Rochester we have recently (this year) been using the lactic acid bacillus as an overrider. Four cases of diphtheria appeared in the state insane hospital. The cases had absolutely no direct connection one with another; but it was found that they had an indirect connection with a certain kitchen. Cultures were made from all of the help of that kitchen and one woman, who had never had any symptoms of diphtheria, was found to be the carrier. Her throat was swabbed and sprayed with various antiseptics of different strengths, and repeatedly, for six weeks, gave positive cultures. Then, at the suggestion of Dr. A. H. Sanford, bacteriologist to the Mayo Clinic, the lactic acid bacillus spray was used. The lactic acid bacillus is harmless, undoubtedly, to human beings; it is easily obtained and is a rapid grower. This spray was used for several days and then, two weeks after that, the woman was examined for the first time and gave negative cultures. About three weeks ago our next cases of diphtheria appeared. Four patients were given antitoxin, their throats swabbed out with tincture of iodin, and no effect obtained in neutralizing the diphtheria growth. Three sprayings were given each person within thirty-six hours, and every subsequent culture was negative. One case was especially severe: A young man came from South Dakota with a well-advanced case of diphtheria. His entire pharynx was blocked with membrane, and within thirty-six hours he was given twenty-eight thousand units, with no effect except to check the increase of the membrane. His throat was swabbed with pure tincture of iodin a number of times without effect; but after being sprayed with the lactic acid bacillus three times within thirty-six hours the membrane showed rapid decrease, and within three days it had entirely disappeared. Before the spraying, all the cultures had been positive; after spraying all were negative. These results are simply suggestive, but are offered that the plan may be carried out by others who have greater opportunity for work. There is one practical point in this connection: If a country physician finds a case of diphtheria and if he is without antitoxin or antiseptics, it would do no harm, and might do good, to flush the nasal cavity and the throat thoroughly with ordinary sour milk.

DR. D. L. RICHARDSON, Providence, R. I.: We have tried all kinds of solutions in the treatment of diphtheria-carriers with about the usual results. We have used silver nitrate solution, staphylococcus spray, iodin, iodin and glycerin, peroxid of hydrogen and bichlorid of mercury as applications to the fauces, to the throat, to the nasopharynx and to the nose, and we have come to the conclusion that cases should be left alone for a certain period of time, no applications being used except some mild solutions when there is a marked nasal discharge. After a certain period, if the cultures continue to be positive, we generally make application of tincture of iodin or of iodin and glycerin. If this, however, proves of no value, we have for eighteen months removed adenoids and tonsils. This latter is, judging from our own experience, a most efficacious method of getting rid of diphtheria bacilli in persistent carriers. Once in a while, we will fail, but I think less frequently than with any other method of treatment. Remember that in getting rid of the foci of infection, the adenoid tissue and tonsils, we have removed the deep infection which local applications could not reach. Then, if overriding with staphylococcus spray is theoretically or practically of any value, by the operation you have infected the throat with the organisms resident in that throat. Whether it is this or the removal of the adenoids and tonsils that rids the throat of the different organisms, I am not sure. I do know that in England they are removing adenoids and tonsils for this purpose. After operation and until discharge, there is little danger of the throats picking up other organisms, whether diphtheritic or otherwise; but it is our custom to quarantine all such cases so long as the throat shows any active inflammatory result after the operation or until the patient is discharged.

DR. C. HAMPSON JONES, Baltimore: In Baltimore we have tried to solve this question not only in the use of all kinds of antiseptics, but also in trying to determine whether or not it is necessary to use anything to clear up the throat.

Drs. W. L. Moss and Guthrie of the Johns Hopkins Hospital carried out a series of experiments during the past twelve or eighteen months. I know that from fifty positive throats that were followed day after day and week after week there were absolutely no cases of disease produced. . . . Exactly what it means we do not know. Of course, Dr. Moss and Dr. Guthrie and others have worked out the strictly scientific end of it, so far as the bacteriology is concerned, and no doubt their report will be found of great interest.

There is one method of clearing up the throat not mentioned to-day, that might be of service somewhere, that is, the use of iodin. The iodin we use is known as Boulton's solution of the national formulary—a combination of phenol (carbolic acid) and iodin—which clears up the throat wonderfully well; but the preliminary spraying of the throat with cocain and going over the throat with the finger, pressing out the crypts, not only of the tonsils but also of the pharynx, will make the subsequent application of Boulton's solution much more effective, because it seems then to get into the crypts.

DR. M. P. RAVENEL, Madison, Wis.: Dr. Jones has brought up an entirely new point of view. Several years ago I recommended that spongy and enlarged tonsils should be massaged. We use the true ivory spatula for this purpose; the finger would do just as well. In cases in which the spray did not act well, massage of the tonsil and use of the spray a second time cleared up the condition in practically every instance, without any trouble. Dr. Jones has brought out another point, namely, the non-contagiousness of the disease in some of these diphtheria-carriers; but what about the condition of the carriers themselves?

Dr. Lawrence and myself have used the staphylococci spray for treatment. It is an excellent method, except in carriers; but we are going to try it next winter early in the case, more exclusively with reference to the treatment of the disease.

DR. E. F. OTIS, Peñuelas, Porto Rico: We are on the right track when we do not treat these tonsils too vigorously with too strong an antiseptic solution. My practice has been to use a very strong alkaline sodium bicarbonate, combined in a normal saline solution, and thus cut away all mucus; and then I use healing oils that are not too strong. I find that this method does not seem to set up an irritating reaction.

DR. HENRY ALBERT, Iowa City, Iowa: The number of methods that have been discussed emphasizes one of the conclusions that we made; namely, that no one method has as yet proved satisfactory for the proper treatment of the carrier condition.

DISEASES OF PORTO RICO*

ELMER F. OTIS, M.S., M.D.
PEÑUELAS, PORTO RICO

Porto Rico is an interesting island-gem forming an emerald setting of the crescent of the West Indies. The climatic and social conditions are such that the various diseases have no difficulty in making great headway, when permitted to pursue their natural course. It is about the diseases here encountered that I wish to speak.

* Read in the Section on Practice of Medicine of the American Medical Association, at the Sixty-Fourth Annual Session, held at Minneapolis, June, 1913.

Manson has well said, "If by 'tropical diseases' be meant diseases peculiar to the tropics, then half a dozen pages might have sufficed for the description [for, at most, only two or three comparatively unimportant diseases strictly deserve that title]. If, on the other hand [the term] include all diseases occurring in the tropics, then the work would require to cover almost the entire range of medicine."

TUBERCULOSIS, TYPHOID AND MALARIA

Tuberculosis, typhoid and malaria may justly receive first mention; while rickets, bronchopneumonia, angina pectoris, venereal diseases, tumors, meningitis and a variety of chronic rheumatic affections are not unfrequently found. On account of the fact that the warm climate favors germ growth, varied forms of enteritis take their full toll from among the young people that are born and reared amid tropical surroundings. The death-rate for this disease alone last year in Porto Rico was 41 per ten thousand.

Tuberculosis is a community disease of the thickly settled parts, and is proving to be a most difficult problem to handle in tropical lands. The *Liga Antituberculosis* is working along the general lines of its sister society in America; while the insular government remembers the distressing condition of her "white-plague" victims by periodic appropriations. On account of the rapidly increasing population of the island the number of deaths from tuberculosis per year is numerically on the increase. The death-rate had dropped, however, from 20 to 14 per ten thousand during the fiscal year 1911-1912.

The people of Porto Rico have until recently supposed that when the diagnosis of pulmonary tuberculosis was established, there was absolutely no hope for them. This idea, working in connection with the lack of climatic stimulation and the prevalence of some very unhygienic customs, makes the cure of the patient and the prevention of the spread of tuberculosis even more difficult than in our northern latitudes. The custom of tightly closing all doors and windows, and thereby excluding the night air which is considered so deleterious, brings with it a baneful effect. Very few indeed of the better houses have any provision for ventilation at night time. Those who live in the "shacks' fare somewhat better from the fact that it is impossible to make these air-tight.

Typhoid fever is practically endemic and, on account of the fact that it is many times confused with paratyphoid and coli bacillosis, reliable statistics are not available. My experience has been that custom strongly opposes the idea that any infectious disease should be diagnosed as it actually exists, and that it should be given the benefit of every possible doubt. Preference is given to a diagnosis that carries with it no unpleasant forebodings.

The general manifestations of malaria seem to be about the same the world over. This, however, is a subject for special study for those of us who are situated in tropical zones. Laboratories are being established whereby we may study its more uncommon manifestations. There is a virulence which goes with it in the warmer latitudes that is not even to be seen in the north. Those who especially study it think that they can see a possible connection between it and the kala-azar of the East Indies or even the black-water fever of Africa. Malignant malaria is exceedingly common, and the treatment must be heroic, else the patient goes into profound delirium or succumbs to intense toxemia.

TROPICAL ANEMIA

Tropical anemia (uncinariasis or what was first called "lazy-man's sickness") is the most interesting to us because of its influence on the health, happiness and prosperity of our people. It was on Porto Rican soil that its identity was first worked out by Ashford. It was here, also, that the enormity of its deleterious effect on human life and efficiency was demonstrated, another of the world's great economic problems, and thereby solved. Its discovery came at a time when practically every one in Porto Rico was infected, and the hungry *jibaros* were crying to heaven for relief from their physical disabilities. They were described by Fray Inigo Abad as "having the appearance and color of convalescents." That was in 1788; and there is little doubt but that the like condition had prevailed since 1530. It was the Medical Corps of the American Army, whose men are ever ready to lay down, if necessary, even life itself, which finally came to the rescue of the Porto Ricans.

The accompanying table gives a few of the results obtained from a special examination of the schoolchildren in our municipality and will be of interest. All classes of children are here represented, and Peñuelas is so situated that almost all physical and climatic conditions are found. Its territory stretches from the coastline to the tops of the mountains. The twelve *barrios* represent almost all industries and social conditions and are therefore typical of the island in general. In spite of the large amount of anemia work that had been done in the place, there was still to be found an average of 38 per cent. of the schoolchildren infected with uncinariasis. Eggs of other parasites, such as *Ascaris*, *Trichocephalus* and more rare varieties, were found in 72.4 per cent. of the feces examined for the hookworms. I observed that an evident pallor was to be detected in 53.3 per cent.; while the average hemoglobin was 81.5 per cent.

SUNDRY DISEASES

Asthma is frequently found.

Whooping-cough is endemic.

Nervous affections limit themselves to a few—largely on account of the simple life of the majority of the inhabitants; but most of the native women are afflicted with a peculiar form of hysteria in which they must be restrained lest they do themselves bodily injury. It is called *ataque*, and sometimes assumes almost an epileptoid nature.

Among eye affections cataracts are frequently found—especially in those suffering from an intense degree of hookworm infection. A persistent form of conjunctivitis is endemic; however, my expreience has been that it responds readily to medication, when the ordinary hygienic measures are adopted.

Trachoma has never been reported, except in a very few cases in which the infection was caught while sojourning in some other country.

Obstruction of the bowels is commonly encountered. The people in general do not attend to their bowels. Not infrequently the country people report having gone from three to six days without a movement, sometimes twenty days or more have passed. On closer inquiry, however, they usually recollect having had "very slight movements once or twice." These abnormally long periods are accounted for by them from the fact that often the patient has eaten very little or nothing during his entire illness.

Idiopathic tetanus is quite often reported.

Eruptive fevers, except possibly scarlet fever, are found in Porto Rico, but are usually of a mild character.

Filariasis (elephantiasis), like malaria, seems to confine itself mostly to certain sections of Porto Rico. No satisfactory explanation for this is offered.

The lepers are segregated in a colony on Goat Island within the San Juan harbor. They usually number about forty.

Sprue is more common than was previously supposed, and is being studied by a special committee of the insular medical society. Dr. Bailey K. Ashford's report will appear in due time.

I have not yet encountered in Porto Rico a case of pellagra or dengue. The vital records show none. The former probably exists there.

Beriberi and yaws have been reported, but I have not as yet heard of the diagnosis being confirmed.

EPIDEMICS

Porto Rico has shared in periodic epidemics with her sister islands for centuries.

Yellow fever is supposed to have originated in the West Indies. No date is given, but it was first reported from Guadaloupe in 1635. Soon afterward it occurred in Barbados, Cuba, Jamaica, Santo Domingo, Martinique and in St. Thomas—forty miles off of our east coast—in 1793. I can find no record of its having become epidemic in Porto Rico, although it is known that occasional cases have been seen there. It is mentioned as having been present in 1783; however it is difficult to obtain accurate data from the Spanish colonial records. Yellow fever is now believed to be a thing of the past in Porto Rico. It has never appeared on the island since the American occupation. During the past year a special campaign has been waged against all kinds of mosquitoes.

Cholera once visited Porto Rico, in 1845, and the experiences are still vivid in the memories of a few of the survivors. The invasion lasted over four months; slaves were decimated by the scourge; it also entered the homes of both rich and poor; the people died "almost in their tracks" and were carted off toward the trenches on the lonely hillsides—sometimes before they were quite dead. One dying woman in a comatose state, who was supposed to have died just as the last rounds for the

CHART OF MORTALITY

Causes of Death	Total Deaths	Proportion per 1,000
1. Diarrhea and enteritis under 2 years	7,349	2.191
2. Diarrhea and enteritis over 2 years	7,309	2.010
3. Pulmonary tuberculosis	1,964	1.458
4. Acute bronchitis	1,389	1.183
5. Anemia. Chlorosis	1,356	1.082
6. Malaria	1,308	1.051
7. Senile debility	1,191	1.027
8. Congenital debility	993	0.963
9. Infantile tetanus	943	0.959
10. Bronchopneumonia	798	0.694
11. Acute nephritis	647	0.562
12. Organic heart disease	505	0.439
13. Other digestive system diseases*	450	0.391
14. Pneumonia	448	0.389
15. Chronic bronchitis	427	0.380
16. Simple meningitis	410	0.356
17. Uncinariasis	404	0.353
18. Typhoid	261	0.227
19. Cirrhosis of the liver	261	0.227
20. Diseases of the intestines	259	0.225
21. Influenza	242	0.210
22. Intestinal parasites	230	0.207
23. Acute endocarditis	228	0.198
24. Other respiratory diseases†	224	0.194
25. Cancer	223	0.194
26. Other forms of tuberculosis	213	0.185
27. Whooping-cough	207	0.180
28. Cerebral hemorrhage. Apoplexy	198	0.172
29. Bright's disease	197	0.171
30. Diseases of the arteries	188	0.163
31. Dysentery	185	0.160
32. Pulmonary congestion and apoplexy	185	0.160
33. Tetanus (except infantile tetanus)	183	0.159
34. Other diseases of the stomach‡	144	0.125
35. Lack of care	130	0.113
36. Puerperal septicemia	125	0.108
37. Convulsions in children	114	0.099
38. Asthma	100	0.099
39. Angina pectoris	63	0.054
40. Diphtheria and croup	39	0.037
41. Diseases of the bones†	9	0.007
42. Bubonic plague	9	0.008
43. Epidemic dysentery	9	0.008
44. Measles	3	0.002
45. Small-pox	2	0.001
46. Glanders and farcy	2	0.001
47. Malignant pustule	1	0.001

* Except cancer and tuberculosis. † Except tuberculosis. ‡ Except cancer.

night were being made, was being transported by a policeman and peon. The fresh air seems to have revived her till she came to herself and desired an explanation as to what was happening. Thereupon, her superstitious "pall-bearers" dropped their charge and fled. She managed to crawl on her hands and knees to a nearby brook and proceeded to alleviate her burning thirst. She shortly recovered.

Another, a boy living in the rear of his father's provision store, was left to his fate while the family were occupied with the "watch" over his dead brothers. He reasoned thus: Although it is considered very dangerous for a cholera patient to take either food or drink, yet it is better to die in comfort with a full stomach than in the miseries of a forced starvation. He improved the opportunity to steal into the store and consume an incredible amount of both bread and water. He had only sufficient strength to crawl from his cot to the store-room, but he was soon up and about and began to insist that his fellow sufferers should also try these measures. Almost all who tried this method survived. The lad is now an old man and takes great pleasure in relating these and many similar experiences which he had when the druggists were the doctors, and customs ruled supreme.

The treatment in vogue at that time was starvation, and deprivation of water and air. A poultice made from a native cactus was applied hot to the abdomen. For this was sometimes substituted the *balleta*, made by sewing together many thicknesses of blanketing and applied as a protection to the trunk.

Small-pox and typhoid have made their periodic visitations—have been at times almost endemic. Thanks to vaccination and the recent introduction of antityphoid injections, these diseases are now found in inverse proportion to the preventive efforts put forth. In the case of typhoid, the campaign against flies and the use of calcium hypochlorite in the drinking-waters has greatly assisted in the results. There are still to be found among the adults many who are pock-marked—an object lesson as to existing conditions in former days. The radical treatment of threatened typhoid epidemics of the last year by the free vaccination of the people gave brilliant results; and I have yet to find a single case in which a person developed the fever after having had the three injections.

Plague was discovered in the Port of San Juan, June 18, 1912, and was immediately recognized. The management and control of the situation by the sanitary department, seconded by the United States War Department, is another brilliant object lesson to the world as to what may be accomplished by concerted effort. There was a total of fifty-five cases with thirty-six deaths. The situation was controlled mainly by the vigorous campaign against rats; and also the use of the antiseptic injections. The last case developed on September 8.

It was demonstrated that the public control of an epidemic need not seriously influence commerce, but serves rather as a safeguard to business by instilling confidence into the minds of the citizens.

Dangers of Short-Circuiting in the Feeding of Infants.—In my private practice I meet wasting infants, who immediately after birth have been submitted to the tender mercies of a wet-nurse in full lactation. If a healthy infant cannot be expected to short-circuit the colostrum period, how much more improbable is it that a delicate and degenerate infant, on whose life, perhaps, much depends, will be able to dispense with simple lessons in digestion, and learn to run before it can walk.—Eric Pritchard, in (London) *Clinical Journal.*

THE EFFECTS OF COLLOIDAL COPPER WITH AN ANALYSIS OF THE THERAPEUTIC CRITERIA IN HUMAN CANCER*

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During the past six months, the activities of the research staff of the General Memorial Hospital, devoted under the auspices of the Cornell Medical College to the investigation of malignant disease in human beings, have been in part directed to an analysis of the effects of metals in colloidal solution. In the present communication, the results obtained from a study of colloidal copper will be briefly described. This part of the work is now at an end, and it seems advisable, in view of the very considerable interest in the effects of copper in cases of malignant disease, to contribute to the general discussion of the subject the clinical records which have been collected, and such additional data in this connection as seem to be fairly well established. These records and data have been contributed in part by the clinical service of the hospital, in part by the laboratory departments both of the university and of the hospital, which have severally cooperated in the investigation of this subject. The clinical observations have been made by Drs. Brown, Michailovsky and myself; the chemical data have been contributed by Drs. Benedict and Lewis; the pathologic examinations were made by Dr. Ewing; the photographic and roentgenographic services have been under the direction of Drs. Cole and Holding.

Interest in the therapeutic effects of colloidal solutions of the metals has been very active for about fifteen years. This interest has been largely confined to the effects of these substances in the infectious diseases, owing to the fact that collargol, in particular, has been highly recommended and widely employed in gonorrheal ophthalmia and in general sepsis. During the course of the past year (1912), however, attention was drawn in Germany and France to the fact that the experimental tumors of animals are very strikingly influenced, and in some cases cured, by the intravenous injections of colloidal solutions of the heavy metals and of their compounds. In December, 1912, Leo Loeb[1] and his co-workers published a preliminary article on the effects of colloidal copper in human cancer, containing a detailed report on eight cases. In summarizing their results they state that they "are now able to cause the gradual retrogression of human cancer which until now has withstood various modes of treatment; and, furthermore, that the treatment does not seem to be limited to one kind of cancer, but applicable in the effective treatment of various kinds of cancer." In detail, they observed relief from pain, improvement in the function of diseased areas, general constitutional improvement and gain in weight. The tumors decreased in size, induration lessened or disappeared, granulations sprang up and cicatrization or epidermization played their normal rôle in obliterating or covering the defects produced by the disease. The authors point out, however, that "patients, in whom the growth of metastases is very rapid and extensive, and in whom the cachexia is already very pronounced, cannot yet be benefited by this mode of treatment." In two subsequent papers, of which the latest appeared in May,

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* From the Cancer Research Service of the Cornell University Medical School in the General Memorial Hospital, and the Huntington Fund for Cancer Research.

1. Loeb, Leo; McClurg, C. B., and Sweek, W. O.: The Treatment of Human Cancer with Intravenous Injections of Colloidal Copper, Interstate Med. Jour., 1912, xix, 1015.

1913, Loeb[2] confirms his previous report, and adds further records of cases in which colloidal copper has caused a more or less marked diminution in the size of various malignant tumors, citing cases of medullary sarcoma of the humerus, of infiltrating carcinoma of the mouth and cheeks, of multiple carcinoma of the face and neck, of carcinoma of the thyroid, etc.

PREPARATION AND ADMINISTRATION OF COLLOIDAL COPPER

Shortly after the appearance of his first publication, Dr. Loeb was kind enough to give us complete details as to the preparation of the copper solution and as to its mode of administration. Since that time, we have used the method in the treatment of twelve ward patients in the Research Service of the General Memorial Hospital.

In the preparation of the copper, we have followed the method originally employed by Loeb, who states that he followed the method of Bredig.[3] In the solutions prepared in our laboratory the copper was found to be present in amounts averaging 30 mg. per liter (quart). Whether this copper is present as a metal, as an oxid or as a hydroxid has not yet been determined, but one of the latter seems the more likely. When freshly prepared, the solutions give the enzyme reaction with hydrogen peroxid, but only slightly or not at all with benzidin. Within twenty-four hours or less, however, this reaction is markedly diminished or lost. In order to avoid this as well as other secondary changes, we have made a practice of using only fresh solutions.

In the administration of the solution we have followed Loeb's plan, employing exclusively the intravenous route and making injections, so far as possible, on every day of the period of treatment. In this connection arose a problem of theoretical interest and also of some practical importance concerning the behavior of the colloidal solution when in contact with the blood. It has long been known that certain colloidal solutions have a tendency to precipitate each other. When such precipitation occurs, the colloidal state is, of course, altered, and the special properties which characterize substances when in that state are thereby destroyed. In order to determine whether or not such precipitation was likely to occur in the blood-stream on the introduction of colloidal copper, we made a series of test-tube determinations, in which blood-serum and colloidal copper were mixed in varying proportions. The results of these determinations will not here be given in detail. The accompanying table, however, is included in order to illustrate the fact that, in certain proportions, mixtures of human blood-serum and of colloidal copper solutions do produce flocculation. This flocculation is due chiefly, if not entirely, to the copper, and not to the serum. The table confirms the law, deduced by Buxton and his co-workers in Cornell, that colloidal solutions of the heavy metals, when mixed with other colloids in a series of dilutions, present a prozone, in which no flocculation occurs, a midzone of flocculation, and a postzone, in which, again, flocculation is absent.

The table shows the results of mixing equal parts of blood-serum, and of a solution of "colloidal copper," the former diluted with normal salt solution, the latter diluted with distilled water, in the proportions indicated. Controls of copper with salt solution, and of serum with distilled water, in the same proportions as those used in this table, failed to show flocculation.

The table is designed to cover all such combinations of colloidal copper and of blood as might probably result from the intravenous injection of the former. The copper solution might conceivably be introduced in a stream of less volume than that of the blood circulating in the vein, or the reverse of this condition might obtain. The table demonstrates that only in case the blood-serum is approximately one-sixtieth, or less than that, of the copper solution in volume does flocculation occur. Under the conditions which governed the injections as made by us, it is safe to assume that the blood-stream always dilutes the copper solution in a relatively greater volume than this; the factor of flocculation may therefore be excluded.

VARIOUS DILUTIONS OF RESULTS OF MIXING EQUAL PARTS OF BLOOD-SERUM WITH SOLUTIONS OF COLLOIDAL COPPER

	SERUM DILUTIONS									
Copper	1:15	1:20	1:25	1:30	1:35	1:40	1:45	1:100	1:500	1:1,000
Undiluted...	—	†	†	†	++	++	++	++	+	+
½	—	†	†	+	+	++	++	++	+	—
¼	—	†	†	+	+	++	++	++	+	—
⅛	—	—	—	—	—	—	—	†	†	—
1/16	—	—	—	—	—	—	—	—	—	—

The signs used have the following significations: +, immediate moderate flocculation; ++, immediate pronounced flocculation; †, flocculation after incubation; —, no flocculation.

The fact that the administration of copper in this form has a very marked tendency to produce phlebitis and periphlebitis, and that this tendency becomes accentuated with repeated injections, renders it advisable constantly to vary the site of injection. In a long-continued course of treatment, it becomes necessary to call into requisition all available superficial veins of both upper and lower extremities. On this account obese persons are most unfavorable subjects for treatment and must, in many instances, be considered entirely unsuitable. With the exercise of the utmost precaution, it is frequently impossible to avoid the occurrence of some degree of phlebitis. This may not amount to much more than a slight induration of the veins with some pain. On the other hand, there may be an extreme grade of induration, with thrombosis, severe pain, tense edema, superficial discoloration along the path of the veins and all the concomitants of an intense phlebitis and thrombophlebitis. These lesions, however threatening clinically, have not in any of our cases been associated with more than a very low grade of pyrexia or general malaise. The inference is permissible that they are not septic or infectious in character, but represent merely the result of a chemical irritation of the endothelium. This conclusion is borne out by the inflammatory reaction which almost regularly accompanies the loss of small amounts of the copper solution into the subcutaneous tissue. As might be expected, under this assumption, the local symptoms rapidly subside when treatment is withheld. In no case have we witnessed any clinical indication of embolism, or infarct formation. In some persons the phlebitis has resulted regularly in the obliteration of the affected veins, so that eventually none was left accessible to injection. As a consequence of the impairment to the return circulation, there may be, as in one of our cases, a more or less prolonged condition of low-grade subcutaneous edema.

2. Loeb, Leo: Summary of Investigations in Tumor Growth Carried out in the Research Department of the Barnard (Free) Skin and Cancer Hospital, St. Louis, Interstate Med. Jour., 1913, xx, p. 398.

3. Bredig: (Anorganische Fermente, Leipsic, 1901, p. 34) asserts that colloidal copper is one of the metals which cannot be prepared by this method.

The factors which determine the production of this symptom are somewhat elusive. In a series of patients who daily received injections of identically the same solutions, some responded quite characteristically with inflammatory reactions, whereas others did not. Personal idiosyncrasy apparently plays a preponderating rôle in the result. Whether this idiosyncrasy is dependent on certain features of the blood, or of the veins, has not been determined.

GENERAL EFFECTS OF THE INJECTIONS

The constitutional effects of the injections, aside from their effects on the tumors, are of importance. Loeb drew attention to the fact that the earlier injections are followed invariably by a rise of temperature and frequently by a chill. He states that these manifestations decrease in severity with subsequent injections. "The general condition (appetite, strength, complexion) improves." Our own experience does not entirely coincide with these statements. They hold true indeed, of some of our patients. On the other hand, certain of the patients bore very large daily injections—up to 700 c.c. —without any rise of temperature during the earlier period of the treatment, whereas they subsequently reacted violently. In still others, throughout the treatment chills and pyrexia were a constant accompaniment of the injections. These symptoms are not in themselves of serious import, in spite of the fact that they somewhat impair the general health and comfort of the patient. A more disquieting symptom is the nausea, sometimes associated with vomiting, which occasionally occurs and which may materially interfere with the proper nutrition of the patient.

In spite of these undesirable features of the treatment, however, the majority of the patients stand it fairly well over a period of about one month. We have not, indeed, observed that the "general condition improves." On the contrary, our cases have almost without exception shown a slight, though steady, loss of weight, as a rule not exceeding from 5 to 10 pounds. Hemoglobin determinations have shown, as a rule, a steady deterioration of the blood, ranging from 10 to 20 per cent. of the original hemoglobin estimation previous to the use of the injections. These undesirable, though by no means serious, sequelae, seem to us to be attributable to the effects of the copper rather than to the natural progress of the disease and its associated cachexia. Many of our patients have improved perceptibly on the cessation of treatment.

The rather striking pallor of many of these patients cannot be explained on the basis of an increased anemia. It is entirely in excess of the calculable loss of hemoglobin. In view of the generally accepted belief that the colloidal metals injure the wall of the capillaries, a belief which is based on the observed effects in animals, it may possibly be due to a spasm of the superficial vessels. At all events, it is well to realize that the pallor in these cases is no index of their anemia.

A rather striking symptom is the hemoglobinuria which occasionally accompanies an injection. In some patients this is a very exceptional symptom, while in others it has occurred with greater frequency. It is in itself of no great moment, inasmuch as the corresponding degree of destruction of the red blood-cells cannot be great. The hemoglobinuria is never more than slight. In one case, in which it occurred with some frequency, we tried to determine whether the destruction of the red cells was due to the copper or to the distilled water. The injection of distilled water alone, however, on the few occasions on which it was tried, failed to produce the symptom. We are of the opinion, therefore, that the copper exercises some toxic influence on the red blood-cells.

The same toxic effect manifests itself on the kidneys. It is the rule, and not the exception, that the cases under treatment show small amounts of albumin in the urine. If albumin had previously been present, it is likely to be increased in amount. This symptom is in itself of no great clinical importance. The patients give none of the evidences of renal insufficiency, unless occasional headaches be reckoned in this category. It is of importance, however, in conjunction with the hemoglobinuria, as indicating that the copper is not without a destructive effect on the normal tissues and organs of the body.

This impression receives some confirmation from the examination of the organs removed at necropsy from a patient who had been under treatment. The following details have been excerpted from the pathologic report:

> The liver shows capillary congestion. The liver cells show slight granular and fatty degeneration. Their nuclei are greatly increased in number and vary in size, presenting many giant nuclei. The peripheries of the lobules contain a heavy deposit of coarse granular pigment. The right kidney is in a condition of advanced atrophy with interstitial fibrosis. The left is the seat of an intense acute degeneration of tubule cells, many of which are necrotic. The glomeruli show moderate old fibrosis. The tumor is well nourished and actively growing.

In the absence of other etiologic factors, it seems justifiable to attribute these lesions to the action of the copper, especially, in view of the fact that the clinical observations previously described lend definite support to this interpretation.

As regards the excretion of the copper, our analyses show that little, if any, leaves the body in the urine. On the other hand, large amounts are found in the feces. In the absence of a prolonged series of quantitative determinations, it cannot be said that the total amount of the copper introduced by the veins leaves the body by way of the intestines, but it is certain that the major portion can be recovered in the feces.

The distribution of the copper in the body, assuming that a part of it is stored up for a time, is a matter of great interest. As bearing on the problem, we have data derived from one operation and from one necropsy. The case which came to operation was one of sarcoma of the jaw. The patient had been given almost daily injections of the copper solution for a month, during which period he had received, in all, 11½ liters. The injections had been discontinued a few days before the operation. A mass of tumor tissue weighing a little over 60 gm. was examined chemically for copper. Not the slightest reaction, however, could be determined. In view of the fact that the method of analysis employed was found reliable in the recovery of very small amounts[4] of copper when mechanically mixed with organ débris, and that, in another case, considerable amounts were obtained from the liver, it is safe to assume that the tumor tissue in this case contained practically no copper.

The necropsy was obtained on a case of embryonal sarcoma, originating in the testicle, and metastasizing to the abdominal lymph-nodes. The patient had received about 3 liters of the copper preparation, and was under treatment until the time of his death. Of the tissues removed at necropsy, the liver, kidney and tumor were submitted to chemical analysis for copper. In a 30-gram

4. When 5 mg. of copper, as copper sulphate, were mixed with 60 mg. of tissue, all except a small fraction was recovered.

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and in a 60-gram portion of tumor tissue no trace of copper could be found. The kidney, likewise, was entirely free. In a 90-gram portion of the liver 1.8 mg. of copper were determined, giving a ratio of 20 mg. of copper per kilogram of liver substance. It has long been known that the heavy metals when introduced in considerable quantities into the body, whether by way of the stomach or by any other method, tend to become deposited in the liver. To this rule the intravenous injection of metals in the colloidal state seems to form no exception. In an article published during the current year, Duhamel[5] has shown that when rabbits receive a solution of colloidal iron intravenously, approximately 90 per cent. of the total iron recoverable from the body is found in the liver. In this respect, therefore, the findings in our case are entirely in harmony with those hitherto reported.

The absence of copper from the tumors in both of these cases is an observation of some importance. If there were a special affinity between the tumor tissue and the copper—and such an affinity must in all probability be posited if the copper does indeed exercise a specific toxic effect on the tumor—it would be reasonable to expect the presence of copper in some amount in the tumor tissue. Its absence is a priori, a material obstacle to the assumption of any such affinity. There is, indeed, an alternative possibility. It has been suggested that the effects of the colloidal metals in the experimental tumors of animals may be secondary to circulatory disturbances produced by the toxic action of these substances on the endothelia of the capillary muscles. This interpretation is supported by the striking and immediate vascular alterations in such tumors, following the injections. In the case of human tumors, no such vascular concomitants have been observed. At the most, Loeb mentions a passing and slight hyperemia. This possible explanation of the described action of colloidal copper on human tumors cannot, therefore, be entertained. Whatever the explanation may be, the fact remains that no traces of copper could be determined by chemical examination of the tumor tissues examined by us.

CRITERIA OF THERAPEUTIC EFFECTS

In determining the effects of any given mode of treatment on a tumor, a variety of criteria may be relied on. Circulatory changes in the tumor, the relief of pain and the restoration of a secondarily impaired function are certain of the criteria on which stress has been laid by the majority of observers in the past. Important as are these criteria in determining the progress of purely inflammatory processes, it is unquestionable that their value in judging of the effects of therapeutic methods when applied to malignant disease is open to criticism. It is a curious and interesting fact that almost every therapeutic claim made in recent years in connection with cancer has included among its virtues the relief of pain. This is true of vaccination with cancer tissue, of Hodenpyl's method and of many others. Loeb likewise observed it in his cases. In view of this very general effect, not much stress can be laid on this symptom, and it is probably fair to assume that in the great majority of these cases the result is in no small measure psychic. The improvement of function is also largely a subjective phenomenon, and as such requires most careful criticism. Osler relates that he has known a patient with gastric cancer to be relieved of digestive disturbances and to gain 18 pounds in weight as the result simply of the visit of a sanguine consultant who denied the presence of a tumor. Improvement in the ability to chew food, to articulate words or to move a limb are phenomena familiar to those who attempt to treat cases of cancer. The victims of this disease seem to be in a very high degree "suggestible" and impressionable and respond nobly to every therapeutic effort. We have therefore noted, but laid no stress on, this group of criteria.

Circulatory changes in tumors offer an interesting group of clinical symptoms. The observation has often been made, especially in ulcerated new growths, that treatment is associated with swelling, peripheral hyperemia, and an altered character of the discharge. In spite of the fact that there is no reasonable relationship between this congeries of symptoms and the actual cure of the tumor, they generally receive considerable emphasis and are cited as an indication of the specific local action of the agent employed. It may be stated by way of preliminary that these symptoms do, as an actual fact, sometimes accompany the administration of colloidal copper. Indeed, they are described in some detail by Loeb. It is also true, however, that the growth may continue to advance in spite of their presence. It is of some importance to inquire into the mechanism which produces these circulatory changes and into their clinical interpretation. It is a well-known fact that many drugs, when introduced into the body either by the mouth or through the skin, are excreted not only by the normal channels of elimination, such as the kidney or the intestine, but also from such ulcerated surfaces as may be present on the body. This is easily shown to be true, for example, of certain of the anilin dyes, which, when introduced by way of the veins, produce an intense discoloration of the dressings over ulcers. It is likewise true of certain of the metals, such as arsenic. In order to understand the series of events previously enumerated it is therefore only necessary to assume that copper, like many other substances, is excreted from the ulcerated surface of tumors. As an irritant, it will tend to produce hyperemia of the margins of the ulcer, and an increase of the secretions. As an astringent, however, it may produce just the opposite of these effects. Such a result, however striking, is purely accidental, and has no necessary bearing on the growth or destruction of the tumor itself. It constitutes a symptom on which no reliance should be placed.

Excluding from consideration all of these secondary factors, we may conclude that the observation of the size of the tumor itself is the sole criterion on which we can place reliance in judging of the effect of therapeutic measures. This implies, in the first place, that a tumor must be accessible to fairly accurate measurement. Tumors of the uterus, for example, and intra-abdominal growths will only exceptionally fall into this class. In the second place, indirect evidence of a decrease in the size of tumors, such as is afforded by the increased permeability of obstructed passages, as in the case of tumors of the esophagus, pylorus or intestine, must be accepted only with great reserve. Remissions in the obstructive symptoms characteristic of such tumors are a frequent feature of the normal evolution of the clinical history of such growths. The relief of obstruction, however, may be due either to necrosis of the obstructing portions of the tumor, while the remainder continues to grow progressively, or to a relief of the accompanying muscular spasm. Finally, evidence of decrease afforded by the roentgenogram is not sufficiently exact in most cases to afford ground for so important a conclusion as that at present in question.

5. Duhamel: Compt. rend. Soc. de Biol., 1913.

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Not only must there be unquestionable evidence, however, of the diminution in size of the tumor, but this diminution must be of a kind not ordinarily attributable to the natural evolution of the tumor. For example, it is stated by Loeb that "a case of multiple carcinoma of the face and neck is markedly improved as a result of the treatment." Without venturing any opinion as to the conditions which obtain in Loeb's case, it is safe to say that multiple tumors offer enormous difficulties in the matter of interpreting therapeutic results. At present we have in the wards of the hospital a patient with multiple metastatic carcinomas of the skin. For several months we have at intervals made accurate measurements of certain of these tumors and have found that some have undergone retrogression, others have entirely disappeared, while still others have continued to grow steadily. In the case which afforded the ascitic fluid used in Hodenpyl's experiments, many of the lymphatic metastases underwent complete retrogression, while the metastatic process in the liver, as was demonstrated at necropsy, increased progressively, and ultimately almost destroyed that organ. Thus, in multiple carcinosis, the retrogression of individual nodules is no indication that therapeutic intervention has produced an improvement.

I shall not delay to emphasize those variations in the size of solid tumors which accompany hemorrhage and its absorption, edematous swelling, necrosis in the depths, and other familiar factors which clinically simulate, or induce, the softening and the reduction that are so often attributed to therapeutic interference. But it is important to draw attention to a similar feature in that type of superficial epithelioma known as rodent ulcer. These new growths not infrequently advance at one point of the periphery, while they recede at another, and thus cicatrization and contracture may simulate a partial recovery. This effect is due in part to alterations not in the growth itself, but in the accompanying ulcerative process. The secretions from the growths, especially if confined under dressings, may have eroded and destroyed the surrounding skin, and it is tempting to interpret a recession of the associated ulcerative disease as an indication of a favorable effect on the new growth. It is unquestionably this aspect of rodent ulcers which plays so generously into the hands of the numerous nostrum venders for this disease.

In brief, the demonstrable reduction in size of a tumor, of a kind not to be attributed to the natural processes of evolution of that tumor or of its associated lesions, is the one essential feature of effective therapeutic intervention.

THERAPEUTIC EFFECTS

The twelve cases treated by us included various types of new growth. There were two cases of cancer of the breast, one of which was very active and extensive; one case of cancer of the rectum; one case of metastatic cancer of the great omentum; two cases of superficial epithelioma, of face and of neck, respectively; four cases of sarcoma, and two cases classed tentatively as endothelioma. Of these cases, four received a thorough and prolonged course of treatment; four received between fifteen and twenty injections; in the remaining four the undesirable sequelae and symptoms of the method itself caused us to discontinue it, in spite of the fact that less than twenty injections had been given. I have chosen from fifteen to twenty injections as defining the meaning of an adequate test of the treatment in any case, in view of the fact that Loeb himself in his second communication states that after this number of injections no further improvement was, as a rule, obtained. In some of our cases, however, over thirty injections were given.

Judged by the therapeutic criteria which have been previously defined, our patients have failed to manifest any improvement under colloidal copper. Every other feature described in the preceding paragraphs we have witnessed—improvement in spirits, in a feeling of strength, in appetite, in function; improvement in the character of the discharge; increased hyperemia; in fact, every symptom of a specific effect, except the crucial condition, namely, a destruction of tumor substance. In the superficial epitheliomas there was so striking a change in the accessory features, notably in the character of the discharge, that careful and unprejudiced observers were positive that the tumor itself had improved; but accurate and regular measurements by means of calipers invariably demonstrated that the tumor itself had remained unaffected, and that there was, at one or more points in the periphery, a progressive advance.

In one case we observed certain apparent effects of the treatment which seem worthy of more detailed description:

CASE 1.—*History.*—The patient, aged 45, entered the hospital Dec. 18, 1912. On admission he presented symptoms of extensive involvement of the right lung, and of an intracranial new growth; in addition he had a few large lymph-nodes in the right groin. In another hospital some of the lymph-nodes in the groin had been removed for diagnosis, and had been reported as endotheliomatous, a view in which Dr. Ewing concurred after a study of the sections. The important features of the case were the cerebral symptoms, consisting of severe headache, frequent attacks of projectile vomiting and a double optic atrophy with blindness. These symptoms had been present, with marked variation in intensity, for a period of two years. The patient had been sent in for a decompression, and begged for operation as a means of relief.

Treatment and Course.—From December 24 to January 1, the patient received copper almost daily; from January 24 to February 1, treatment was suspended; it was resumed on February 1 and continued to February 15. During this period he received, in all, over 11.5 liters of colloidal copper solution intravenously. By December 29, the headache had become much less severe, and vomiting had ceased. After the injections were stopped, January 24, there was a return of the symptoms, which again yielded to a second course of injections. The patient was improved in health and spirits during this time, in spite of the fact that he suffered severely from phlebitis. His weight remained constant. He was now discharged at his own request.

March 5, he was readmitted, complaining of severe vomiting, headache and deafness. For five days he received intravenous injections of small amounts of colloidal arsenic, but without improvement. In fact, his condition became complicated by the onset of delusions and delirium. March 17, copper was again administered, and continued daily in large amounts. There was marked improvement in a few days with the disappearance of all cerebral symptoms. The treatment had to be discontinued because of phlebitis. During this second course of treatment the patient received 9 liters. His weight fell from 108 to 102; his hemoglobin dropped from 67 to 62 (by corrected Sahli).

The case is certainly of great interest as indicating an apparent improvement consequent on the use of copper, on three separate occasions. In the absence of direct observation of the intracranial growths, however, judgment as to the mechanism of this effect must be suspended. The accessible new growths, namely, those in the groins, showed no alterations during the treatment. As regards remissions in the cerebral symptoms accompanying tumors, it is well known that they may spontaneously occur and that a person may manifest severe

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symptoms of intracranial pressure and within a comparatively short time again be free from them. This feature of intracranial tumors has been made the subject of a long and careful clinical analysis by Hawthorn,[6] in a series of studies recently published. It had long ago been recognized by Hughlings Jackson. The cause of these striking changes is, of course, unknown; but they have generaly been ascribed to circulatory variations in and around the tumors. The fact that just such changes may, and do, occur independently of treatment, illustrates the difficulty in interpreting the phenomena from the point of view of the therapeutist. At all events, in no other case did we observe any such striking coincidence between treatment and symptomatic improvement. It is entirely possible, however, that in cases of this type the use of colloidal copper might regularly be productive of favorable results of the character described.

CONCLUSIONS

The preparation described by Loeb as colloidal copper has been administered in twelve cases of malignant disease, in eight of which the treatment was thoroughly carried out. The treatment resulted in most of the cases in the production of mild constitutional effects, such as fever, chills, nausea, some loss in weight, slight reduction of hemoglobin, and occasional albuminuria or hemoglobinuria. Chemical analysis of two tumors from treated patients failed to reveal the presence of copper, while in a liver obtained at necropsy it was present in appreciable quantity. Judged by certain clinical criteria, which have been adopted as a reliable standard of therapeutic effectiveness, the treatment has not appeared to exert a destructive action on the tumor tissue in any of the cases.

CASE-REPORTS

Only such cases as seemed to offer data of special interest have been summarized.

CASE 2.—J. W., man, aged 44, admitted Jan. 23, 1913. Diagnosis: Papillary epithelioma of face. Growth on left side of face of ten years' duration, during which time it had been subjected to various modes of medical and surgical treatment. Growth on admission presented appearance of flat fungating mass, irregularly ulcerated. Purulent discharge, of ill odor; cicatrization, with marked contracture at one angle; sluggish granulations over the base of ulcer. Growth measured 8.5 cm. across, and 4 cm. from above downward. An accurate silhouette made with the help of calipers, and revised at end of each week of treatment.

Eighteen injections, from January 25 to February 17, totaling 7,300 c.c. Ulcer assumed a much more healthy look, granulations improved, discharge lessened and general appearance of growth greatly improved. Measurements made, February 20, showed increase of a little over 1 cm. in each diameter. Extensive and severe periphlebitis and thrombophlebitis. Treatment well borne. No albuminuria, but hemoglobinuria once. Weight fell from 201 to 190; hemoglobin, from 100 to 76 (by Sahli).

Operation: February 27. Radical removal, curettage and fulguration.

CASE 3.—S. L., man, aged 18, admitted Dec. 26, 1912. Diagnosis: Sarcoma of right upper jaw. First appearance of growth dates back seven months. External swelling measures 2½ inches across. No ulceration. General condition of patient excellent.

Treatment: Between December 27 and January 26, twenty-four injections, totaling 11,525 c.c. of copper solution; average almost 500 c.c. During this period measurements of growth were made at frequent intervals. Slow but progressive increase in size of tumor, at a rate which corresponded, so far as could be calculated, approximately with rate of growth previous to treatment. Patient persistently asserted improvement. No loss in weight, or change in general condition.

Operation: On February 4, removal by Dr. Coley. At present, June 1, no sign of recurrence.

Extract from pathologic report: "The section is composed chiefly of medium-sized spindle-cells, with slightly hyperchromatic nuclei and much finely fibrillar intercellular substance. . . . There are many small, irregular, bony and osteoid trabeculae, also many fine globules lying between the cells, which appear to be of osteoid nature. . . . Diagnosis: spindle-cell osteogenic sarcoma."

On admission patient had a faint systolic murmur. After operation he failed to recuperate properly. Weight fell from 117 to 100; hemoglobin dropped to 64. In spite of the absence of characteristic symptoms, the diagnosis of malignant endocarditis was made. This has been confirmed at Mount Sinai Hospital by blood-culture findings.

CASE 4.—L. N., man, aged 28, admitted Jan. 15, 1913. Diagnosis: Recurrent sarcoma of chest wall. Four years ago first observed lump under skin of chest. Removed in April, 1908. Recurred in 1909, and again removed. Recurred, and removed for the third time in 1910. Recurred, and treated by Coley's toxins, which proved ineffective. Fourth removal in 1912.

On admission to hospital, patient presented small hard mass, overlying fifth rib on right side. Mass measured 3.9 cm. by 2 cm. It was movable on the deep parts, and not attached to the skin.

From January 17 to February 7 patient received eighteen injections, totaling 6,800 c.c. During this time, loss in weight of 10 pounds. For a few days there appeared to be slight diminution in size of tumor, followed by a period of active and advancing growth; February 8, long diameter measured 4.8 cm.

CASE 5.—J. W., man, aged 54. Diagnosis: Epithelioma of neck. History of twenty years' duration. Ulcerated area measured 8 by 9.5 cm.

Between December 28 and February 1, sixteen injections, totaling 5,900 c.c. Marked phlebitis. Headache, nausea, chills, albuminuria, hemoglobinuria. Progressive improvement in granulations and diminution of discharge. Steady increase in size of growth as measured at intervals by calipers.

CASE 6.—F. A., man, aged 35, admitted March 27, 1913. History extended back almost two years, beginning with enlargement of the cervical lymph-nodes. On admission, chief complaints were difficulty in mastication, pain and paresthesias in the distribution of the second and third divisions of the trigeminus. General nutrition and strength, excellent. On each side of neck, masses of fused lymph-nodes, of moderate size, very hard and immovable on deeper parts. Paralysis of left abducens. Paresis of the temporomasseter and pterygoid groups on left side, and hypesthesia and hypalgesia in distribution of the second and third branches of left fifth.

Examination of nose and accessory sinuses, by Dr. C. G. Coakley, showed left posterior ethmoidal cells and sphenoidal sinus completely filled with hard masses of new growth. This finding confirmed by roentgenoscopy. Patient's weight, 145 pounds. Hemoglobin, 90 per cent. (by corrected Sahli). Urine, normal in every respect. Diagnosis: Primary tumor of nasal sinus, with metastases in cervical lymph-nodes and extension into cranial cavity, involving fifth and sixth nerves at base.

One of smaller lymph-nodes in neck removed for pathologic examination. On this, pathologic report was as follows:

"The node is largely replaced by an alveolar tumor in which there is considerable fibrosis. The cells are arranged in small groups or long anastomosing columns which are usually sharply separated from the connective tissue. Cells are large, polygonal, epithelioid, with pale bodies and multiple nucleoli. They often appear syncytial. There are many large vacuoles, and a great variety of cell inclusions. Diagnosis doubtful; either endothelioma, or epithelioma from transitional stratified epithelium."

From April 6 to May 22 the patient received thirty-five injections, totalling 15,200 c.c. Average, over 430 c.c. for each injection. During treatment no loss in weight or strength.

6. Hawthorne: Studies in Clinical Medicine, 1912, p. 71.

Hemoglobin fell from 90 to 79. Urine regularly showed small amounts of albumin, and occasionally hemoglobin in sufficient amounts to produce distinct discoloration. During first period of treatment patient said that he felt benefited, but toward end asserted that he had become worse. Progressive increase in size of the cervical masses. May 14, ophthalmoscopic examination revealed moderate swelling of both disks, with congestion of temporal halves. On admission the disks had been found normal.

In this case, therefore, there was a failure of the treatment either to hold the growth in check, or to induce any evident degenerative changes in it.

CASE 7.—I. R., woman, aged 64, admitted Jan. 3, 1913. Four months previously patient observed lumps in abdomen. Dec. 20, 1912, operated on by Dr. Hartwell at Presbyterian Hospital. He reported an omental tumor; also a small growth on each ovary and one along greater curvature of stomach. "A specimen was taken for examination from the omental tumor, which proved to be carcinoma, the cells being arranged somewhat in tubular form, but the pathologists were unwilling to state the primary origin of the tumor."

On admission the omental tumor was demarcated as accurately as possible, and measurements taken. From January 16 to February 25, patient received twenty injections, totaling 5,225 c.c., and averaging 260 c.c. for each injection. Injections were well borne. Tumor, however, showed a steady increase in size.

In Cases 6 and 7, copper was prepared by electrolysis, as for the other cases, but with a somewhat different technic.

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SKIN RASHES FOLLOWING THE ADMINISTRATION OF ATOPHAN

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During the past two years atophan has been used extensively in the treatment of gout, arthritis of different forms and neuritis. Its use has also been recommended in migraine, sciatica, lumbago, iritis, episcleritis, otosclerosis, pyorrhea alveolaris, eczema and urticaria. The purpose of this paper is to call attention to the occurrence of various skin rashes—purpura, urticaria and scarlatiniform eruptions—caused by the administration of atophan as exemplified in the cases reported herewith.

REPORT OF CASES

CASE 1.—Man, aged 56, who for twelve years had suffered from the polyarticular form of arthritis deformans, was first given atophan in July, 1911, 7½ grains being administered four times daily. Ten days later a purpuric eruption appeared over the anterior surface of the lower extremities, extending from the knee down to the dorsum of the foot. The lesions were in the form of numerous small petechiae. The medicine was discontinued and in ten days the eruption had entirely disappeared. A week later the medicine was given again in the same dosage and four days later the petechiae again developed, disappearing a few days after the atophan was stopped. Altogether during the past two years the same experience occurred four times in this patient, that is, every time that this dosage of atophan was taken. It did not occur from smaller dosage.

CASE 2.—Man, aged 45, with chronic arthritis of four years' duration, was given 7½ grains of atophan four times daily. Two days after its first administration a severe urticaria developed, affecting the body and extremities and lasting one week. In this patient the atophan was given again one week later, 30 grains of sodium bicarbonate being given with each dose, and the rash reappeared only in very mild form and disappeared again three or four days later without necessitating the stoppage of the drug. Whether or not the sodium bicarbonate was of value in preventing the occurrence of the urticaria is a question that might be raised.

CASE 3.—Woman, aged 72, suffering from slight pain in the knees, was given 7½ grains of atophan three times daily. After the second dose numerous urticarial lesions appeared on the body and the medicine was discontinued. It was given again one week later and again the urticaria appeared.

CASE 4.—Woman, aged 65, was seen in consultation because of very severe urticaria, affecting the body and extremities, which had persisted for one week. Atophan had been taken in 7½-grain doses three times daily for one month. The urticaria disappeared four days after the drug was stopped. In this case I had no opportunity to find out whether or not it would reappear if the drug was again given.

CASE 5.—Woman, aged 53, with chronic arthritis of the left hip, was given 7½ grains of atophan four times daily. The next day a diffuse scarlatiniform eruption appeared over the entire body, extremities and face. This was unaccompanied by fever or sore throat, and disappeared in two days after the drug was stopped. The following week the atophan was again given in the same dose as before, and the next day the scarlatiniform eruption was present, disappearing as before when the drug was discontinued. This scarlatiniform eruption was accompanied by severe itching.

CONCLUSION

These cases show that skin rashes, resembling those following the administration of antipyrin, are not uncommon after atophan has been taken, and that this drug should not be given in the treatment of urticaria as has been advised. Müller[1] has called attention to the occurrence of a scarlatiniform eruption in the case of a girl, aged 23 years. In this patient from 2 to 3 gm. of atophan were given daily in the treatment of arthritis. In the discussion of Müller's paper, Porges mentioned the fact that he had seen urticaria in cases in which atophan had been given.

NERVE-BLOCKING AS A SUBSTITUTE FOR GENERAL ANESTHESIA IN SURGICAL OPERATIONS

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Notwithstanding the inestimable advantages and blessings of general anesthesia as a method of inducing insensibility for surgical purposes, it is not without its serious drawbacks. In addition to the fact that most persons shrink from the idea of losing consciousness, general anesthesia has attached to it not only unpleasant after-effects, such as nausea, vomiting, headache, pulmonary irritation, pneumonia, suppression of urine, etc., but also the occasional, unavoidable sudden death.

It has long been the hope of surgeons and experimenters that some method of inducing insensibility to pain might be discovered which would be free from all the objectionable features of practically all the present known methods of inducing general anesthesia, and this hope seems now to be realized. Physical pain is the perception of afferent impulses received from that portion of the body which is the subject of injury. If no impulses reach the brain from the injured part, no pain is felt. The impulses or stimuli are transmitted from the periphery to the centers exclusively by the sensory nerves. If the power of the nerves to transmit these

1. Müller: Nebenwirkung des Atophans, Gesellsch. f. inn. Med. u. Kinderh., Feb. 13, 1913; abstr., Therap. Monatsh., xxvii, June, 1913, p. 468.

impulses be temporarily suspended by any means, any amount of injury may be inflicted to the parts supplied by the nerves whose function is suspended without the patient being conscious of such injury. The newer method of inducing anesthesia consists in suspending temporarily the power of the nerves to transmit afferent impulses and is called nerve-blocking. Nerve-blocking is produced by infiltrating a small portion of the nerve somewhere in its course between the periphery and the spinal cord with some substance which temporarily suspends its action. Not only does nerve-blocking prevent absolutely all pain from the region blocked, but it likewise prevents completely all general shock from any injury received to the parts blocked.

Shock may be defined as a condition in which there has been a sudden or rapid discharge of the potential energy of the nerve-centers, the result of afferent impulses or stimula, due to peripheral injury. Without afferent stimuli, shock cannot be induced. By blocking the nerve to the passage of afferent stimuli, shock as an element in peripheral injury is entirely and completely eliminated. A leg for instance, the nerves from which have been blocked, may be crushed without the slightest evidence of pain or shock to the patient. As a surgical operation in a sense is simply an injury to some part of the body, it necessarily follows from what has preceded that a surgical operation performed on any portion of the body the nerves from which have been blocked will be unaccompanied by either pain or shock. During general anesthesia no pain is perceived, but shock is always induced, the anesthetic notwithstanding. Every surgeon knows that shock is always present to a greater or less degree, in all operations performed under general anesthesia, the degree of shock depending on the amount of injury done and the duration of the operation, but it remained for Crile to demonstrate by experiment that even under profound general anesthesia afferent impulses are still received by the nerve-centers and that the potential energy of these centers is discharged by those impulses and thus shock results. Of course the shock is by no means so great as without the anesthetic, but it is an unavoidable element in every operation performed under general anesthesia, while under complete nerve-blocking, shock is absolutely and entirely eliminated. It may seem almost incredible to many that the flesh can be cut and the bone sawed with the patient in full consciousness, yet perceiving no pain and suffering no shock; but such is a fact. That consciousness is retained in these operations may seem to many to be an objection to the method, but I think that in the majority of the cases it is a distinct advantage. There is no unpleasant psychic effect, as might be supposed, and even in nervous persons and children I have found no trouble in this respect. In addition to the fear of loss of consciousness the horror which many persons have of an operation is based on the fear of pain. If unconsciousness and all pain and shock be eliminated the operation has been robbed completely of all its terrors; and this is exactly what nerve-blocking does.

Some months ago I began doing operations under nerve-blocking. The method proved so satisfactory in every way that its use was rapidly extended, until at present I do almost all of my operations by this method, and the use of a general anesthetic has become a rare exception. During this time I have operated on carcinomas of the face; tubercular glands of the neck; goiters and other tumors of the neck; carbuncles of the back of the neck; numerous affections of the extremities, including the plating of fractures; tumors of the abdominal wall; hernias; appendectomies, both acute and interval; gastrostomies; gastro-enterostomies; acute intestinal obstruction, due to volvulus and peritoneal bands; ovarian tumors; uterine fibroids; suprapubic and perineal prostatectomies; movable kidney; stones in the ureter and bladder; affections of the rectum, perineum and vagina, etc. It is unnecessary to give in detail all of these operations, but a few may be mentioned briefly to show what can be accomplished and how little effect operations done under nerve-blocking have on the patient.

REPORT OF CASES

CASE 1.—Mrs. R., aged 42, had, I think, the largest goiter that I ever attempted to remove. It was composed of three distinct masses, that on the right side extending so high as to displace the lobe of the ear; that in the midline extending from the chin to the sternum, while that on the left side extended considerably below the upper end of the sternum. It compressed the trachea so that she had great trouble in breathing. The operation was a difficult one and took nearly an hour and a half to complete. The patient talked to me repeatedly during the operation and expressed herself as suffering no pain. She left the table with a pulse of 88; it was usually 80 during the several days she was in the hospital before the operation. At the end of the operation she asked for a drink of water, which was given her. The next day she requested to be allowed to sit up, and made a rapid recovery.

CASE 2.—Miss G., aged 12, had been suffering for some time with a large bunch of tuberculous lymph-nodes of the neck which had broken down and had been partially operated on by some one before. The dissection was a difficult one and required the removal of a portion of the jugular vein. It was done by blocking the cervical plexus and not a particle of a general anesthetic was given. Twice during the operation she was asked if she would like to be put to sleep, but she said "No, go ahead and finish the operation." It is very evident that she suffered no pain, for being but a child of 12 she could not have controlled herself had she had any great pain. She had had ether for the first operation, which was small compared to this one, but she said she would not think of taking ether again for an operation.

CASE 3.—Mr. K., aged 56, had marked obstruction of the pylorus; fully 50 per cent. of a barium meal was still found in the stomach after twenty-four hours, as shown by the Roentgen ray. He vomited daily and had lost many pounds in weight. A diagnosis of carcinoma of the stomach was made. The abdomen was opened under nerve-blocking. No mass was found in the stomach or the pylorus, and there were no glandular metastases. The stomach was opened and explored thoroughly. The stenosis of the pylorus which was very marked was evidently benign in its origin. The stomach was closed and the usual posterior gastroenterostomy done. When the patient went to the operating-room his pulse was 72, and on his return from the operating-room it was 74. He expressed himself as scarcely knowing that he had been operated on.

CASE 4.—Mrs. M. had a large multilocular ovarian cyst, the size of an eight months' pregnancy. Operation performed under nerve-blocking. Extensive adhesions were found, fixing the tumor to the left parietal wall. The patient conversed during the operation and the only thing she said she felt was a peculiar drawing sensation in the abdomen when the tumor was turned out. She left the operating-room smiling and talking pleasantly with the nurse. She wanted to get up the next day.

CASE 5.—Mr. G. had a small sharp-angled stone lodged in the lower end of the left ureter, which was giving him a great deal of trouble. The nerves supplying the left lower portion of the trunk and pelvis were blocked. The usual extraperitoneal incision for exposing the lower ureter was made. The ureter was followed down as far as possible, but the stone could not be felt. The peritoneum was opened and the ureter palpated down to the bladder, but the stone still escaped detection. The peritoneum was closed and the incision carried downward and inward until the fundus of the bladder

could be reached. The ureter was opened at the brim of the pelvis and a long probe introduced. The bladder was opened so that the finger could be inserted, and the stone could now be felt between the end of the probe in the ureter and the finger in the bladder. After some manipulation the stone was finally pushed on into the bladder and removed. The operation was long and tedious. The patient's pulse at the end of the operation was 86, during the several days that he was in the hospital before the operation his pulse had ranged from 76 to 80.

These cases are sufficient to show what can be done under nerve-blocking and to show the entire absence of shock even in very severe and prolonged operations. This absence of shock is very remarkable indeed. Not a single patient on whom I have operated under nerve-blocking has expressed a regret at not having taken a general anesthetic, but all have been delighted with the result and every one has stated that were he obliged to submit to another operation, he would not think of taking a general anesthetic.

The technic of the method is quite simple. The nerves supplying the part are infiltrated for a short distance somewhere between the part to be operated on and the spinal cord. The method is entirely different from the old intraspinal anesthesia. There are several substances which will block nerves in this way, among which may be mentioned cocain, the various forms of eucain, stovain, novocain, quinin and urea hydrochlorid, etc. Some of these are so toxic as to be unsuited to the purpose. The substances which I have used are novocain and quinin and urea hydrochlorid, the former in solution 0.0025 : 0.01 with the latter 0.0025 : 0.005 solution. These substances are but very slightly toxic and may be used to the extent of several hundred cubic centimeters, depending on the strength of the solution. The exact points of injection naturally depend on the region to be blocked. The idea is to block all of the nerves supplying the part to be operated on. One must have an accurate knowledge of anatomy and some experience in order to reach the right points successfully. After the injection, it requires from five to thirty minutes for the anesthesia to become complete, depending on the place of injection and the size of the nerve to be infiltrated. As the method requires some skill and practice to secure perfect results, we see opened up here a new field for the expert anesthetist or nerve-blocker, one who in a busy clinic can have the patient ready for the operator at the right time. The method is so simple, so successful, and possesses so many advantages that it opens up a new era in surgery and I believe marks the passing of the general anesthetic in surgical operations. Fuller details regarding technic and points of injection will be enlarged on in a future paper.

32 North State Street.

"What I Have Said, I Have Said," or The Folly of Always Adhering to One's Original Diagnosis.—Moynihan said that some surgeons seemed to think that it was a humiliation for them to open an abdomen, after making a diagnosis on reasonable grounds, and not to discover the particular condition which they had supposed to be present. He had himself no compunction in throwing his diagnosis aside as soon as it was found to be wrong and going in search of something else. . . . And if any precedent was required it could be found in the example of Saul, who went in search of his father's asses and found a kingdom. The one thing against which he could not inveigh too strongly and too constantly was that of making the diagnosis, not verifying it at the operation, but proceeding, nevertheless, to the performance of the operation originally planned.—(London) *Clinical Journal.*

MANGANESE TOXICOSIS

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From the paper of L. Casamajor[1] I learn that in the mines and factories of America cases of manganese toxicosis occur not infrequently; cases such as have been described, first, in 1823, by Couper; in 1901 by myself[2] and Embden and then by Friedel. That induces me to communicate briefly to my American colleagues my clinical observations in connection with that interesting and well-known morbid state.

I think that the nervous affections among workmen in factories who are occupied with the production of potassium permanganate and among workmen in mills who are working in an atmosphere full of dust of manganates and in workmen in manganese mills, are produced through the inspiration of dust containing manganates.

I reach that conclusion from the circumstance that in the factory from which I gathered my observations, after the spread of dust had been prevented, the workmen were thenceforth free from such affections.

The symptoms are the following: In the beginning of the disease there occur convulsive laughter, weeping and mental alterations of every kind. In the progress of the disease comes a period during which the patients show the symptoms of retropulsion and a complex of symptoms which resembles the Romberg symptom, but differs somewhat from it. At this time one finds spastic gait, increase of the tendon reflexes, no alimentary glycosuria. Babinski's reflex occurs by plantar flexion in the physiologic way. One observes, further, increased salivation, mask-like expression of the face and monotonous voice. Later on the mental symptoms recede and one observes a gait which is characterized by the patient's stepping forth with the metatarsophalangeal joint first. The prognosis as to life is good, as to recovery bad. The affections may show a standstill; the symptom of retropulsion and the pseudo-Romberg symptom may vanish, but in well-developed cases the gait I here describe persists so that complete restoration is scarcely probable. But I do not deny that slight affections occur which may be cured without persisting gait-troubles after the ceasing of the symptoms described above.

The diagnosis is easily made from the circumstance that people showing those symptoms are usually found occupied in the production of potassium permanganate; in manganese mills and in mines containing ores rich in manganous oxid.

Experiments with dogs, in order to produce the disease by allowing them to inspire a dust full of manganates through a period of months had no results. The treatment consists in the use of cold-water cures, physical exercises, use of the walking-chair (described by me), use of electricity in the form of galvanization, faradization and high-frequency.

I desire to mention that I observed a case from such a factory which showed similar symptoms, and, besides, a marked reduction of the white and red fields of vision, and yet, after a very short time, the patient recovered. Therefore, I think that we must recognize in this case—

1. Casamajor, Louis: An Unusual Form of Mineral Poisoning Affecting the Nervous System: Manganese? THE JOURNAL A. M. A., March 1, 1913, p. 646.
2. von Jaksch, R.: Die Vergiftungen, Ed. 2, Vienna, Leipsic, Hölder, 1910.

the patient being a very intelligent workman who watched with terror the disease of his fellows—a case of manganophobia.

Finally, I mention that I could not succeed in discovering manganese compounds in the urine even after examining great amounts of urine from many such patients together. Nor could I find any evidence of this in such cases in the post-mortem examination.

REPORT OF A CASE OF MONOCULAR PARALYSIS OF THE ACCOMMODATION DUE TO LUES

JESSE WRIGHT DOWNEY, JR., M.D.
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BALTIMORE

The following case is thought to be worthy of recording, not only because of the comparative rarity of the condition, but also with the belief that the lesion was probably prodromal of a more serious central nervous system involvement, which has probably been prevented, and certainly has been stayed by prompt antisyphilitic treatment.

Mr. N. S. D. was referred to me Jan. 28, 1913, by Dr. Thomas R. Boggs, through whose courtesy I am now at liberty to report the case. The patient had had syphilis five years previously and at that time had been under treatment for eighteen months; since then his general health had been excellent. On January 12, following a long stretch of book work, to which he was unaccustomed, he had felt a fluttering sensation in the left eye and a day or so later had noticed that the vision of that eye was quite blurred for reading. The condition continuing, he came to Baltimore for an examination. Following a general examination by Dr. Boggs, which disclosed nothing of importance except a positive Wassermann reaction. I found the following eye condition:

Right Eye: Pupil normal in size, responding normally to light. Fundus normal. Vision 20/20. Punctum proximum, 18 cm.

Left Eye: Pupil partially dilated, responding very sluggishly to light. Fundus normal. Vision 20/30 (with + .50 sp. ⌒ + .25 cy. ax. 90° = 20/20). A plus 4 D. sp. lens was required to bring the punctum proximum to 18 cm. Field normal for white, blue and red.

Consensual reaction from right to left, very slight. From left to right, normal. The right pupil responded to accommodation, the left did not. Both pupils responded to convergence.

The condition was clearly a paralysis of the accommodation of the left eye with probably a slight involvement of the sphincter pupillae. Wilder[1] reports two similar cases and quotes Hosch's records of five cases and Alexander's report of twenty-eight, all luetic. The lesion is probably nuclear and lies between the sphincter nucleus and the point where the fibers from the ciliary nucleus joins the pupillary light reflex bundle.

Under the direction of Dr. Boggs, the patient was given an intravenous injection of salvarsan and placed under appropriate treatment.

Feb. 23, 1913, the patient reported by letter as follows:

Physically I am feeling fine and the vision of the left eye is much better. I can now read newspaper print with that eye at short range, though there is still some haziness. The pupil is somewhat larger than that of the right eye, but it is hardly noticeable.

July 9, I had the privilege of again examining Mr. D. and found that the pupils were equal, the accommodation of the left eye had completely recovered its normal functioning and the reflexes were normal. A Wassermann test gave a negative reaction.

506 Cathedral Street.

1. Wilder: Ann. Ophth., April, 1897.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

GLUTEN FOOD A, Barker's.—Barker's gluten food A is gluten flour prepared from wheat and contains not more than 4 per cent. of carbohydrates and 87 per cent. of protein.

Barker's gluten food A is made from wheat flour by elutriation. It is a granular powder practically without odor or taste and is insoluble in water.

Actions and Uses.—Barker's gluten food A is indicated when a diet practically free from carbohydrates is desired, especially in most forms of diabetes. It can be taken uncooked or made into muffins.

The nutritive value of 500 gm. of Barker's gluten food A corresponds to 1850 calories, of which 1740 are due to protein, 80 to carbohydrates and 30 to fat. (Rep. Conn. Agr. Exp. Sta., 1913, Part 1, p. 18.)

Manufactured by Herman Barker, Somerville, Mass. No U. S. patent or trademark.

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Manufactured by Herman Barker, Somerville, Mass. No. U. S. patent or trademark.

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Actions and Uses.—Barker's gluten food C is indicated when a diet practically free from carbohydrates is desired, especially in most forms of diabetes. It can be taken uncooked or made into muffins.

The nutritive value of 500 gm. of Barker's gluten food C corresponds to 1880 calories, of which 1680 are due to protein, 170 to carbohydrates and 30 to fat. (Rep. Conn. Agr. Exp. Sta., 1913, Part 1, p. 18.)

Manufactured by Herman Barker, Somerville, Mass. No. U. S. patent or trademark.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET . . . CHICAGO, ILL.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

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SATURDAY, SEPTEMBER 27, 1913

THE GASTRIC MOVEMENTS IN HUNGER

The detailed experimental analysis to which the physiology of hunger has been subjected by Cannon of Harvard and Carlson of Chicago has revealed a large number of facts of immediate import made doubly valuable because in many instances they were ascertained or controlled on man. It is now clear that the sensation of hunger, or the "hunger pang," is due to periodic contractions of the empty stomach rather than to some less definite temporary nutritive condition or state of the blood. We have already commented[1] on the further fact that the hunger contractions can be controlled. All stimuli that act on the end-organs of taste and general sensation in the mouth cavity, as for example in the case of chewing palatable food during hunger, reflexly inhibit these gastric movements.

In searching for the actual cause of the hunger contractions of the empty stomach, the stimulus for which might be conceived to be some condition of the blood or sought in the vagus tone or in a primary automaticity of the gastric neuromuscular mechanism, Carlson[2] has discovered further inhibitory phenomena of not a little interest. Water, at body temperature or nearly ice-cold, acting directly on the gastric mucosa inhibits the tonus and the hunger contractions of the stomach. All acids, or liquids containing acids, including normal human gastric juice, check these movements of the empty stomach. The duration of the acid inhibition is said to be determined in all probability by three factors: (1) passing of the acid into the duodenum, (2) fixation and neutralization of the acid by the mucous gastric secretion, and (3) neutralization by bile and intestinal juice which at times pass into the stomach through the dilated pylorus. The degree of inhibition produced by normal gastric juice is the same as that caused by an equal quantity of hydrochloric acid of a concentration equal to the free acidity of the gastric juice. It would thus seem that the hydrochloric acid in the gastric juice constitutes the stimulus that leads to the inhibition.

These striking features at once bring to mind what seems to be a contradictory fact, namely, that such acid inhibitions do not become manifest during the gastric movements in normal digestion, although the stomach is frequently filled at such periods with strongly acid secretion. Indeed, there is reason to believe that during digestion a certain degree of free acidity actually facilitates the digestive movements. Carlson has pointed out that it does not follow, because acid in the stomach inhibits the hunger contractions but not the digestion contractions, that the mechanisms involved in these two types of gastric activity are necessarily different, for the digestive movements involve primarily the pyloric end, while the hunger movements involve the fundus of the stomach. It is possible that acid stimulation of the nerve endings in the gastric mucosa leads reflexly to inhibition of the fundus and peristalsis of the pyloric region of the stomach.

Trials with alkalies make it clear that alkalinity has the same effect on the hunger contractions as acidity only to a lesser degree. Most striking, however, is the unexpected, yet undeniable outcome of the investigation regarding the effect of alcoholic beverages on the hunger contractions of the stomach. From the wide-spread belief that a glass of wine, beer or other alcoholic fluid taken before meals increases the appetite (and perhaps the hunger), and from the authentic statements that a drink of wine seems to initiate the sensation of hunger, one would expect to find that the tonus and gastric contractions which give rise to it are distinctly augmented by these beverages. The results proved to be the very opposite. Wine, beer, brandy and pure alcohol introduced directly into the empty stomach inhibit the hunger contractions of the organ instead of increasing them. Indeed, they cause inhibition only. As a possible explanation for this paradox we may cite some of Carlson's comments regarding the failure of alcoholic beverages either to initiate or to increase hunger. He says that since most alcoholic beverages stimulate the end-organs of taste and smell as well as those of general sensibility in the mouth cavity and in the esophagus, it is possible that this stimulation in some way augments or initiates appetite for food. If this is true we have the singular phenomenon of alcoholic beverages augmenting appetite and inhibiting hunger at the same time. There can be little doubt that cerebral states as modified by training and habit are also a factor in the apparent action of alcoholic beverages on appetite. It is certain that a person's first taste of them does not focus his attention on food and eating. If alcoholic beverages in the stomach caused as marked inhibition of the stomach movements in digestion as they do in the case of the stomach movements in hunger, even moderate drinking with meals would speedily lead to acute indigestion. Inasmuch as this is not the case, the assumption seems warranted that alcoholic beverages affect the mechanisms of the two types of movement differently.

1. The Stomach in Hunger, Editorial, THE JOURNAL A. M. A., Feb. 8, 1913, p. 448.

2. Carlson, A. J.: The Influence of Stimulation of the Gastric Mucosa on the Contractions of the Empty Stomach (Hunger Contractions) in Man, Am. Jour. Physiol., 1913, xxxii, 245.

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As a corollary to the fact that acids as well as normal gastric juice inhibit the hunger contractions of the stomach, it may be supposed that persons having gastric hypersecretion or hyperchlorhydria experience little or no true pangs of hunger of gastric origin. We are not familiar with clinical observations on this point. It is by no means impossible, however, that in cases of prolonged hypersecretion the inhibitory influence of the acid on the overstimulated mucosa is gradually abolished so that a readjustment and restitution of hunger phenomena may occur even in such cases.

THE TRUTH ABOUT OZONE

The necessity for taking with critical doubt statements and claims made by those who have for sale something of claimed prophylactic or therapeutic value, is again demonstrated by the articles elsewhere in this issue on ozone. By the manufacturers of ozonizing machines ozone has been vaunted as a valuable remedy in many diseases, as an effective room disinfectant, as a "purifier of the air" and a restorer of exhausted human vitality. How misleading and even mischievous such claims are is shown by the detailed investigation and discussion of the ozone question by Jordan and Carlson. Ozone is a toxic gas. So far as the evidence goes ozone produces no reaction in the human organism or in the lower animals that can be regarded as in any degree beneficial either in combating or warding off infectious disease. On the contrary, all appreciable physiologic changes produced by the inhalation of ozone are distinctly of an injurious and weakening character.

The claims made for ozone as an aid to practical room ventilation would be farcical if they were not altogether deplorable. So far as the destruction of bacteria is concerned ozone is of no practical importance. The experiments of Jordan and Carlson are independently confirmed by the work of Sawyer, Beckwith and Skolfield, also published in this issue of THE JOURNAL. The results of all scientific investigation of this subject, in fact, are in substantial accord. An amount of ozone that can be tolerated in the air of a room by human beings has no bactericidal action. Even much larger amounts are relatively inactive and feeble compared with other well-known gaseous disinfectants.

As a "deodorizer" ozone is of dubious value. While in very great concentrations ozone seems capable of oxidizing some odorous substances, it is without effect on others, as for example, ammonia vapor. The "deodorizing" effect of ozone is, however, largely a masking effect due in part to the intensive odor of ozone itself (very disagreeable to many persons) and in part perhaps to fatigue or anesthesia of the olfactory epithelium. We agree with the authors cited in the statement that "it is probable that the injury to the respiratory tract by ozone in sufficient concentration to act as an effective mask is of greater moment than the deleterious action of most odors." Why try to mask or destroy odors when they are simply a danger-signal that ought to be heeded?

The claim that the operation of an ozonizing machine in a room makes the occupants "feel better" and display more energy is beside the point. So do other irritants. So does a cocktail—temporarily. Any device for whipping up a fagged brain, whether inhalation of a poisonous gas or something else, will seem to unobservant people to be of benefit. At how great a cost their temporary burst of energy or feeling of well-being may be secured is well known. It is quite possible, furthermore, that some of the effects attributed to ozonizers in "freshening" the air are nothing but the results of air currents which, as is well known, favor heat regulation by the body, and differ in no wise from the results obtainable by a simple electric fan. There is in fact no evidence that can reasonably lead us to add a poisonous gas, such as ozone is, to the air of rooms or to administer it to a patient.

One aspect of the matter is the responsibility of reputable and honorable manufacturers for the exploitation of cures and remedies. We do not for a moment question the good faith of many who have urged the use of ozonizers or their belief in the efficacy of their wares. It is easy, however, for those whose business it is to convince others of the worth of their merchandise to begin by convincing themselves with insufficient evidence. To all such we would commend for consideration that little fable with which the clear-thinking and plain-spoken young physicist Clifford prefaces a discussion of "The Duty of Inquiry." "A shipowner was about to send to sea an emigrant ship. He knew that she was old, and not over-well built at the first; that she had seen many seas and climes, and often had needed repairs. Doubts had been suggested to him that possibly she was not seaworthy. These doubts preyed on his mind and made him unhappy; he thought that perhaps he ought to have her thoroughly overhauled and refitted, even though this should put him to great expense. Before the ship sailed, however, he succeeded in overcoming these melancholy reflections. He said to himself that she had gone safely through so many voyages and weathered so many storms that it was idle to suppose she would not come safely home from this trip also. He would put his trust in Providence, which could hardly fail to protect all these unhappy families that were leaving their fatherland to seek for better times elsewhere. He would dismiss from his mind all ungenerous suspicions about the honesty of builders and contractors. In such ways he acquired a sincere and comfortable conviction that his vessel was thoroughly safe and seaworthy; he watched her departure with a light heart, and benevolent wishes for the success of the exiles in their strange new home that was to be; and he got his insurance-money when she went down in mid-ocean and told no tales.

"What shall we say of him? Surely this: that he was verily guilty of the death of those men. It is admitted that he did sincerely believe in the soundness of his

ship; but the sincerity of his conviction can in no wise help him, because *he had no right to believe on such evidence as was before him.* He had acquired his belief, not by honestly earning it in patient investigation, but by stifling his doubts. And although in the end he may have felt so sure about it that he could not think otherwise, yet inasmuch as he had knowingly and willingly worked himself into that frame of mind, he must be held responsible for it."

HEALTH AND FINANCE

It has been said that this is an age which places an ever-increasing emphasis on the relation of good health to individual hygiene, to social effectiveness, to general prosperity. Other things being equal, the race is to the community whose children thrive and whose workers keep well. As relates to the community, at least, human health is a purchasable commodity, as has been repeatedly demonstrated. Cuba, Panama and the Philippines afford examples, each, however, under control as to forces and expenditures differing from those of the ordinary community, but confronting conditions infinitely more difficult. And even at that the expenditure has not been relatively great. The average community is in far better position to purchase health.

New York City, with its advanced health ordinances and comparatively liberal supply of money to carry them out, is a striking example of what an urban community can do in the way of a radical reduction in infant mortality and in the general death-rate. Yakima County, Washington, is another example showing the result of systematic health work and liberal expenditure in a rural district. In twelve months under a full-time health officer, with a well-equipped laboratory and a corps of visiting nurses and sanitary inspectors, the death-rate in the county from typhoid fever was reduced from 128 per hundred thousand to sixteen, and the deaths from all causes fell from 538 in 1911 to 393 in 1912. Other instances of like effective work might be cited.

As the mayor of Colorado Springs said recently in welcoming the delegates to the meeting of the American Public Health Association, the problems of public health are even more vital than those of individual health. Appreciation of this fact comes slowly. Money to purchase public health is given grudgingly by those in charge of the public purse. For instance, St. Louis, the fourth city in the United States in both population and manufactures, spends annually only $100,000 on its health department, whereas it spends $2,000,000 annually on its police department, twenty times the amount spent for the promotion of public health. It might be added that a large portion of this expenditure for police protection —and this applies to all cities—is made necessary by the tolerance of the saloon and the brothel, two important direct sources of ill health (as well as crime) which add to the burden of the health department with its inadequate appropriation. Larger appropriations for health purposes will only follow the creation of public sentiment demanding them, and in accomplishing this the newspapers must perhaps play the chief rôle. The St. Louis *Republic*, recognizing this, has applied itself to the creation of a public demand for better support of the health department of St. Louis, and will present a plan for making that city the healthiest in the United States. At present the death-rate in that city is considerably less than that of other large cities in the same latitude, and almost as low as that of Cleveland, New York and San Francisco, cities more favorably located geographically and climatically; but it is believed that it can be made still less. This commendable object will require not only increased appropriations for the health department, but the sustained cooperation of all the citizens, and it is this cooperation which, with an intelligent grasp of the requirements, the *Republic* has begun a campaign to secure.

The newspapers and the citizens of every community should awake to the fact that community health is a first principle of effective local government, and should adopt for their slogan, Public Health Is a Purchasable Commodity.

THE NUTRITION OF THE POOR

These are days in which problems of economy in living are forcing themselves on the attention of the public mind. The rise of prices has intruded itself into the conduct of the household and compelled a readjustment in some cases in the distribution of income among the various channels of expenditure. Whatever else may happen, it is fundamentally necessary that certain indispensable requisites of clothing, shelter and food be provided if the individual is to be maintained in a state of physiologic equilibrium and economic efficiency. In the so-called "better classes" the appropriations to such purposes can be adjusted without serious difficulties; but as we descend in the scale of available income a border-line is reached at which the barest necessities of life may not always be suitably provided. It is to this stratum of society that the attention of social workers and students of nutrition alike must be directed if reforms are demanded and deserve to be established.

So much has been written about the influence of diet on the physical conditions of the individual, and particularly on growing children who become the workers of the next generation, that most statements in this field appear like trite truisms. There are statistics to indicate that when the weight of children is much below the average for their age, almost without exception their diet is inadequate. This is a single illustration of the way in which the physiologic, and consequently the economic, welfare of the individual among the poorer classes becomes seriously menaced in the struggle for existence. Inasmuch as food is the fuel—the source of energy—of the human machine as well as the very material out of which the body is constructed, man's diet must be seri-

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ously considered not only during the years of growth, when the drain on the body's resources is commonly supposed to be peculiarly severe, but also throughout his working years. The facts have been bluntly, yet effectively expressed by saying that under natural conditions of trade the working man brings into the market his energy—his power of doing work—and obtains for it the most favorable price that he can. His ultimate power as a wage-earner is being influenced by the character of his food-supply. His profits depend, on the one hand, on the amount of energy he can supply and the price at which he can sell it, and, on the other, on the price for which he can buy his source of energy—his food. We refer here particularly to the wage-earning working man, because the amount of food required depends so largely on the amount of work to be done. An abundance of cheap and good food is the first essential for a productive working class.

The late Professor Atwater and his associates in this country have devoted much attention to the food requirements of the working classes and to the cost of living involved thereby. The standards thus obtained have proved of great value in sociologic studies. Examining the conditions in New York City a few years ago, Professor Underhill found that at that time it required an expenditure of considerably more than twenty cents a day to secure the nutriment adequate for the working classes investigated. Small indiscretions in the direction of inexpedient purchases of food readily raised the cost of the minimal requirement. In collaboration with Prof. Noël Paton, Miss Dorothy Lindsay[1] has carried out a most interesting study of the diet of the laboring classes in the city of Glasgow, Scotland, during 1911 and 1912. The inquiry was directed to ascertain whether the working classes of that city get such a diet as will enable them to develop into strong, healthy, energetic men and enable them to do a strenuous day's work, or whether the conditions of the laboring classes are such that a suitable diet is not obtainable. Furthermore, attention was directed to the pertinent question as to whether, if a suitable diet is obtainable, its cost is low enough to leave a margin of income sufficient to cover the other necessary expenses of the family life, with something over for those "pleasures and amenities without which the very continuance of life is of doubtful value."

The Glasgow report, like others that have preceded it, shows how important such investigations are at the present time. In view of the agitation in many quarters for compulsory insurance, it is well to bear in mind as Dr. Paton points out, when dealing with the almost dependent classes, that a very small contribution even for problematic benefits in future years may decrease the expenditure on the family diet, and the benefits may thus be bought at too great a price.

Accepting the standard of energy requirement adopted by the Glasgow investigators, it appears that in the case of the really poor—those who have a daily struggle to make both ends meet—even although, as the statistics show, three-quarters of their meager income is expended on food, a sufficient supply is not obtained, and that the remaining fourth of the income is quite inadequate to defray the necessary outlay on rents, coal, taxes, insurance, etc., while absolutely nothing is left for expenditure on amusements of any kind. The families in which the income is under 20 shillings a week entirely fail to obtain a supply of food sufficient for their needs. Some of the actual facts discovered are worth reciting here. The average daily energy value of all the diets of workingmen's families studied in Glasgow was 3,163 calories, including 110 gm. of protein, 83 gm. of fat and 473 gm. of carbohydrate. Of the protein about two-thirds came from vegetable sources. The principal foods used were bread, potato, milk, sugar, beef and vegetables, such valuable and easily procured products as oatmeal and peas being used in relatively small amounts. Not one of the families in which the wage was regular and under 20 shillings per week had a diet the energy value of which reached the minimum of 3,000 calories per adult man. With increase in income, however, the energy content of the dietary advanced.

One naturally asks what can be done to improve such diets, since it is not within the province of the dietitian directly to alter the financial return to the families. It appears on closer survey of the situation that ignorance and bad marketing play their part as well as penury. The protein-rich animal foods, flesh, fish and eggs, are all too expensive for the laboring classes, and any increase in their proportion in the diet is impracticable. The Glasgow physiologists wisely point out that cheese and the cheap protein-rich vegetable foods, oatmeal, peas, beans, etc., should be more freely used. The chief drawback of the latter is the labor entailed in preparing and cooking them. Here lies an opportunity for a wholesome reform in the technic of the food industries. If the diet of the laboring classes is to be improved decidedly, without increasing the cost, time and labor must be expended on properly preparing the more nutritive foods of vegetable origin for the ready use of man.

Dr. Paton believes that the experiences in Glasgow and Edinburgh teach the same lesson—that what is needed is a partial return to the national dish of porridge and milk, in place of tea, bread and jam which have so universally replaced it in towns and are winning favor even in the rural districts. There is probably little advantage in preaching the value of these old-fashioned dishes. Presumably nothing short of exhibiting the value of different foods, of training in marketing and cooking in schools will have an influence on the future. There is an opportunity here for a splendid propaganda on how to spend money for food to best advantage and how to cook it in the most palatable form. These are not fads; they are the essence of life in a keen struggle for existence.

1. Lindsay, Dorothy E.: Report on a Study of the Diet of the Laboring Classes in the City of Glasgow, Carried out during 1911-1912 under the Auspices of the Corporation of the City; with an Introduction by D. Noël Paton, M.D., Physiological Department, University of Glasgow, 1913.

MILITARY INSTRUCTION FOR MEDICAL STUDENTS

At Gettysburg, Pa., from July 7 to Aug 15, 1913, and at Monterey, Cal., from July 1 to Aug. 8, 1913, two military-instruction encampments were held, attendance at which was permitted only to students from non-military schools. The War Department in projecting these camps, held in consideration the plan, should this experiment be successful, to hold similar encampments annually in each section of the country. The object sought is to augment our small military reserves by a well-trained class of men from whom in time of national emergency a large proportion of commissioned officers could be drawn.

All students physically qualified and properly recommended, who are over 17 years of age, may volunteer for these camps and for the time being must render themselves subservient to military discipline. Instructions and exercises include the application of proper health precautions in camp and on the march, personal hygiene, instruction in military tactics and handling of troops under the conditions of battle. Instruction is also afforded in the care of troops in the field, in the duties of the officers of the medical corps during an engagement with the enemy, on the proper way of removing the wounded from the battle-field to the rear, and on allied subjects. Instruction in shooting is provided and the regular badge for markmanship of the National Rifle Association of the United States is bestowed on those students who make the requisite score. Afternoons and evenings are at the disposal of the student, subject to proper supervision and to military necessity. Opportunity is afforded for acquiring horsemanship and practice is given in riding artillery caissons and horses. Students coming from one institution of learning, if they desire, will be allowed, so far as it is practicable, to be members of one company and will be permitted to share one or adjoining tents. Men selected from among the students will be appointed aids to the company commanders.

The student is thus given a healthy outdoor life for the summer at less expense than is usually required; he acquires habits of obedience, command, self-control, order and personal hygiene; he gains the benefit received from intercourse with students of other institutions, and he has an opportunity to become skilled in athletics and to obtain a knowledge of military art. A certificate is given to each student who attends throughout the entire encampment. Details as to needed equipment, uniform, etc., will be supplied on application to the War Department.

It would unquestionably be well for medical students to volunteer for admittance to these camps. The advantages offered are obvious to the ambitious student desirous of becoming a military surgeon. Those unambitious in this direction would gain an experience of sanitary measures which would be helpful in routine medical practice.

THE THEORY OF ARSENIC THERAPY IN ANEMIAS

Arsenic is one of the drugs most frequently prescribed in various forms of anemia and is probably the one on which the great majority of physicians still rely in the treatment of certain types. Whether or not this therapy has any considerable influence over the course of a disease like pernicious anemia, and even whether or not it is always free from objections, may well be open to question. Although iron and arsenic are commonly depended on to hasten the process of blood regeneration, the entire question of the mode of their action is decidedly obscure. It is always difficult, if not impossible, to estimate to what extent rest and nutrition—in other words, good hygienic measures—contribute to the outcome ascribed to the "stimulating" or "tonic" effect of drugs of the class here included, which is politely clothed with the designation "alterative."

At one time we were taught to assume that arsenic initiates the new formation of blood by virtue of an action directly on the hemopoietic organs, notably the bone-marrow. This point of view has been in part abandoned of late in so far as the marrow has been looked on as the immediate seat of stimulation by the drug. Arsenic is a blood-poison and is currently believed to lead to a destruction of red corpuscles in the peripheral regions of the circulation. Hemolysis and loss of erythrocytes are, however, of themselves provocative of regenerative processes. The organism responds to lack of blood elements and loss of oxygen-carrying power in the circulation by the production of new corpuscles. On this basis we may accordingly believe that arsenic induces a restoration of blood elements not because it directly stimulates the localities concerned in their production, but rather because by causing an actual destruction of corpuscles it indirectly furnishes the occasion for a secondary vigorous compensatory repair of the damage.

Is this hypothesis tenable? Does arsenic act on the blood alone or on the blood-forming organs? The participation of the latter, when it occurs, is made manifest by the presence of "youthful" types of blood-corpuscles, newly formed erythrocytes in the blood. These cells have morphologic features in the guise of nucleated characteristics which betray them to the microscopist. Even more significant, perhaps, is another mark of "newly made" blood, such as that encountered in the regeneration which attends anemias. Morawitz and others have shown that the erythrocytes of circulating blood under normal conditions exhibit no phenomena of "respiration," that is, oxygen consumption. In anemia, however, there is a very marked absorption of oxygen and production of carbon dioxid on the part of the blood-cells. This is so conspicuous and characteristic of regenerated blood that it can frequently be detected chemically even when the morphologically characteristic nucleated or polychromatic new erythrocytes

cannot be discerned. Here, then, is a "test" for the occurrence of regenerative changes in the blood. When it is applied to the behavior of the blood after administration of arsenic the facts observed are the following:[1] Large, toxic quantities produce a mild anemia. The arsenical anemia is hemolytic in character and attended by active compensatory regenerative responses which can readily be detected by the method of estimating oxygen-consumption just referred to. On the other hand, when small doses of arsenic comparable with what are employed in human therapy are experimentally administered to animals, there is no evidence of initial anemia or of consequent regeneration. These facts speak clearly against the theory of compensatory regeneration ascribed to the action of arsenic on the blood in therapy. Investigations with the outcome here noted do not serve to place arsenic therapy for these cases on a more rational or stable basis. It must be remembered, however, that the process of blood-regeneration may be affected differently in health and in disease. It is quite possible that the effects of arsenic which seem to occur clinically must be sought in an influence on conditions that specially prevail in the diseased, in contrast with the healthy organism.

CHEMICAL CONSEQUENCES OF THE REMOVAL OF THE PARATHYROID GLANDS

The complete removal of the parathyroid glands is attended with fatal consequences. This experimental fact speaks decisively with regard to their importance for the maintenance of the bodily functions; it does not, by itself, give any indication of the mode in which the parathyroidal tissue determines the healthy continuance of the normal processes in the organism. As has been done in the case of other so-called glands with internal secretion, so here we may assume that they act in one of several ways—either they furnish some regulatory or stimulating product (a hormone) which is distributed to appropriate parts of the body, or they may act as antitoxic agencies, neutralizing, modifying or destroying products which would otherwise be harmful to the individual.

The most prominent symptoms of abnormality which attend the removal of the parathyroids are perhaps those of tetany. This is of itself suggestive, though by no means demonstrative, of the participation of a toxic agent in the physiologic events caused thereby. The discovery of toxic bases in large quantities in the urine of parathyroidectomized dogs by Dr. Koch[2] at the University of Michigan is therefore of more than passing interest. In every case studied methylguanidin was present in the secretion of the kidneys. When this substance was found in smaller quantities, other guanidin bases were present, so that the excreted guanidin nitrogen approached a constant. In addition to these bases others were observed, namely, beta-imidazolylethylamin, cholin, neurin and unidentified bases, although these were not distributed uniformly in the cases studied.

The histologic picture which appears in the tissues of parathyroidectomized animals is one of cellular disintegration, particularly in such organs as the liver, kidney and brain. Various degrees of chromatolysis are observed in the nuclei, and in some places the latter disappear entirely in large areas. Koch suggests that the passive protein destruction which must accompany such tissue changes may give rise to basic products and thus account for the unusual compounds excreted. Inasmuch as in animals which have been operated on the specific toxic symptoms can be provoked by the feeding of digested protein, it may be that the toxic effects are initiated by products of intestinal or even of parenteral digestion. Normally these derivatives are incorporated in some cell molecule or stored up in some form. In the case of parathyroidectomized animals after feeding digested proteins, it is suggested that the products remain free and act as toxins. In animals operated on when no feeding occurred the symptoms increased in violence with short intermissions until death. The intensity of the symptoms doubtless followed the rate of disintegration of body protein. The pathologic condition would thus appear to be a failure on the part of the cells to build up their protein. This part of the metabolism of the cell, Koch reminds us, is regarded as the function of the nucleus. Such indications, together with the formation of free "nuclein" components, point to a nuclear atrophy. The histologic findings, moreover, show an active "nuclein" degeneration. The reputed relation of the parathyroid to calcium metabolism and the theories of glandular function built up on it have not made effective progress of late. One is not justified at present in saying that these are quite unfounded. Doubtless in the complex disturbances set up by so serious an operation as the complete exclusion of vitally important glands the interrelated consequences are varied and numerous. The outcome of the discovery of the toxic bases in the urine is the suggestion of Koch that the parathyroid secretion appears to be concerned also with anabolic processes related to the synthesis of nuclear contents. Whether or not such a hypothesis can be further substantiated remains to be seen; in any event the final successful isolation of recognized toxic chemical products of traceable origin has paved the way to definite conceptions and specific lines of inquiry where hitherto the explanations have been vague and the outlook unpromising.

1. Saneyoshi, S.: Ueber den Wirkungsmechanismus des Arsenik bei Anämien, Ztschr. f. exper. Path. u. Therap., 1913, xiii, 40.
2. Koch, W. F.: Toxic Bases in the Urine of Parathyroidectomized dogs, Jour. Biol. Chem., 1913, xv, 43.

The Inaugural Symptoms of Gall-Stones.—The error that has found a place in the minds of all medical men, and has been faithfully carried down from one generation of textbooks to another—that in the majority of cases gall-stones cause no symptoms—has been forever dispelled by the work of the surgeon. In operating in cases of advanced cholelithiasis a history of inveterate though perhaps trivial dyspepsia over a long period can almost always be obtained.—Sir Berkeley Moynihan, Address in Surgery, Brit. Med. Assn., 1913.

Current Comment

A LAYMAN'S ADVICE ON ORGANIZATION METHODS

Suggestions of value to our medical societies can often be obtained from civic organizations. In a recent issue of *Suburban Life* Mr. H. J. Howland entertainingly and instructively recites his experiences as president of the Civic Association of Montclair, N. J. "The point," Mr. Howland says, "is to begin with something definite and not too hard, something that needs not discussion but doing. If you have a civic association or improvement society [or, he might have added, a medical society] there is one thing you must avoid like the plague—the adopting of resolutions. The resolution habit is worse than drink, worse than the opium habit. In my brief and inglorious career I put many resolutions to vote, saw them adopted with enthusiasm, and then decorously interred in the archives until I shuddered at the thought that New Year's Day was coming. Do not pass resolutions. Get out and do things." Better advice to our medical organizations could hardly be conceived. Medical societies have from time immemorial been afflicted with the resolution habit. Simply passing resolutions never did anything. If there is something that ought to be done in city, county, state or nation, let us not pass resolutions, but if it can be done, let us go and do it.

NARCOSIS AND LACK OF OXYGEN

In a recent discussion of the nature and underlying factors of anesthesia,[1] reference was made to one of the current views, championed particularly by Verworn, which maintains that a lowered oxidative function of the tissues is responsible for the anesthetic manifestations. On this hypothesis anesthesia would practically be equivalent to a sort of asphyxiation of the cells under the influence of the narcotic. Various telling objections have been offered in criticism of this point of view. It is true that there may be an intimate relation at times between the appearance of narcosis and a tendency toward deficient oxygen-supply in the tissues; but the two factors are by no means interdependent. Narcosis cannot be explained simply on the basis of an inhibition of oxidation, inasmuch as the possibility of narcotizing an individual is not inevitably associated with the existence of oxidative changes in the organism involved. This has now been demonstrated in a convincing way in the case of animals which exist quite independent of respired oxygen, namely, the anoxybiotic intestinal parasites.[2] It is quite easy to keep the familiar intestinal roundworms, ascarides, alive and active in unoxygenated fluids, and still to narcotize them with alcohol or chloroform. They can thereupon be revived again by transfer into fresh fluid mediums without the participation of added oxygen at any time. The inhibition of oxidation in the higher forms of life must therefore at best be only an incident in the genesis of narcosis, not the fundamental determining feature.

1. A View of Anesthesia, editorial, THE JOURNAL A. M. A., Sept. 20, 1913, p. 968.
2. Winterstein, H.: Kritische Uebersicht ü. die Beziehungen zwischen Narkose u. Sauerstoffatmung, Biochem. Ztschr., 1913, li, 143.

CONCERNING "FRIEDMANN VACCINE"

We recently referred[1] to the report of Dr. Barnes of the Rhode Island State Sanatorium for Tuberculosis on his results with the Friedmann vaccine. A complete abstract of this report is given in this issue.[2] It merely adds to the mass of information that goes to make up the literature concerning Friedmann's attempt at exploiting the consumptive, all of which shows the Friedmann treatment to have no advantage over other methods of treating tuberculosis; in all probability, it is even a dangerous one. The medical profession has, until recently, maintained toward this product an attitude of reasonable scientific skepticism. In view of the fact, however, that it seems impossible to find a single reliable favorable report, the time has come for us to cease hoping that in the Friedmann vaccine we have a cure for tuberculosis. Moreover, since the methods of exploitation have become so obviously commercial, with what seems to be an utter disregard for the humanitarian viewpoint, the time surely has come for not only a definite stand against the sale of this product but for positive opposition to the methods used by those financially interested in its promotion. Friedmann secured the financial results which wide-spread newspaper exploitation brought him, and slipped away, leaving a host of "Friedmann institutes" to divide with him the dollars of the too hopeful and credulous sufferers. These "institutes" are being organized in various parts of the country and the personnel of these organizations in practically every instance is sufficient to suggest their true nature. Steps have been taken in several states to check this exploitation of the consumptive for commercial gain, especially in Idaho, Iowa and Arkansas. In others, the weakness of local ordinances has made this impossible. What is now needed is that these unscrupulous attempts should be met with an intensive campaign of education of the public concerning the dangers and worthlessness of this treatment.

1. THE JOURNAL, Sept. 13, 1913, p. 874.
2. Society Proceedings, p. 1086.

THE PRESIDENT'S PROGRAM AND A DEPARTMENT OF HEALTH

President Wilson evidently believes that party platforms are made to be carried out and not merely for the purpose of winning elections. According to Washington newspaper correspondents, it is Mr. Wilson's intention to carry out the promises of the Baltimore platform during the next session of Congress. A recent dispatch from Washington in the Chicago *Tribune* says:

> "The President has insisted that during the pending special session, the Democrats revise the tariff and reform the currency. This will leave them free during the next session and the regular session a year hence to pass bills strengthening the Sherman law so as to destroy the trust evil, conserving natural resources and granting ultimate independence to the Philippines, providing employees' compensation within federal jurisdiction, creating reforms in the civil and criminal laws, limiting the amount of campaign contributions and providing publicity before elections, improving and developing the Mississippi River, and establishing a national health service."

This program includes the principal promises of the Democratic party made before the last election. The public health plank of the Baltimore platform is easily

the strongest declaration on this subject which has been made by any political party:

"We reaffirm our previous declaration advocating the union and strengthening of the various governmental agencies relating to pure foods, quarantine, vital statistics, and human health. Thus united and administering without partiality to or discrimination against any school of medicine or system of healing, they would constitute a single health service not subordinate to any commercial or financial interests, but devoted exclusively to the conservation of human life and efficiency. Moreover, this health service should cooperate with the health agencies of our various states and cities without interference with their prerogatives or with the freedom of individuals to employ such medical or hygienic aid as they may see fit."

This statement, which amply defines the scope and function of such a national department of health as is desirable, and yet fully safeguards the rights of each individual and satisfies the objections of any honest critic, is evidently regarded by Mr. Wilson as one of the most important planks in his party's platform. The inclusion of a national department of health in the administration program cannot fail to be gratifying to all of the advocates of better federal health organization. The discussion of this subject during the past three years has been of immense educational value. The prospects for practical, constructive legislation, providing for an enlarged health machinery as a part of our federal government, are better to-day than ever before. The duty and the opportunity of the medical profession and of medical organizations are clear. Let us be prepared unselfishly and without partisanship to give public-spirited assistance to the administration in devising plans for a national department of health that will be a safeguard to the people against disease and will command the support of all intelligent and public-spirited citizens.

THE OZONE INVESTIGATIONS

Some months ago we received an advertisement of an ozone machine from a large high-grade concern which makes such machines merely as one of the many electrical devices it puts on the market. Previous to this we had been proffered advertisements of many ozone machines as therapeutic agents. These advertisements had been refused, principally because the advertising "literature" issued by the concerns selling the machines was so extravagant and absurd that there was no doubt as to the fraudulence of the devices. The claims made for the machine first referred to, however, were not extravagant and the question then arose as to what good there was in such machines. We asked for evidence on this point, but that submitted was not satisfactory. We concluded, therefore, that it was time to investigate the matter and asked Professors Jordan and Carlson to take it up for us. This they did. When their report was in type and about to be published a report of similar work was received from Drs. Sawyer, Beckwith and Skolfield of San Francisco. It was then decided to hold back the first report so as to have the two appear together, which they do in this issue. The two groups of investigators were working independently and neither knew that the other was attacking the problem. The subject is discussed also on a preceding editorial page.

ETHICS!

"We will pay you $25 for each patient that you bring or send us." Thus, to physicians, writes the Hord Sanitarium of Shelbyville, Indiana, and continues: "We have a perfect and an absolute cure for all liquor and drug addictions." Fearing doubtless that those to whom these offers are made may be disgusted with the first proposition and will realize the evident falsity of the second, the concern encloses a list of references "showing the high moral and professional standing of our sanitarium." The Hord Sanitarium emphasizes further that it does a strictly "no cure no pay" business. Suspiciously similar is the offer made by the Mizer Sanatorium of Coshocton, Ohio, Blake V. Mizer, manager. Not many months ago Mr. Mizer was running the Hord Sanitorium (the concern's own spelling), which at that time advertised "the only guaranteed cure." Now, Mr. Mizer hurls invectives at those concerns that make "unreasonable guarantees" and adds virtuously that "we resort to no such unethical and pretended guarantee in order to do business." Nevertheless, in small type in the northwest corner of his stationery, Mr. Mizer admits that his "proposition" is no cure no pay. The fees of the Mizer Sanatorium "are $125 to $250, depending on the room." The physician's rake-off is "20 per cent. of the above." "This," explains Mr. Mizer blandly, "is simply a matter between ourselves and does not concern the patient in any way." Of course not. All the patient has to do is to pay the bills. And the Mizer Sanatorium is "conducted along ethical . . . lines"—Mr. Mizer says so. The Mizer Sanatorium has odd ideas of what constitutes ethics, medical or otherwise, for not long ago it advertised, in such medical journals as would accept its "copy," that "medical ethics prevents the statement here of the whole truth about the Mizer treatment." Of course medical ethics never prevented truthful statements of any kind. A dirty business; no other words express it. When the Hord Sanitarium and the Mizer Sanatorium claim to cure all cases of drug or liquor addiction, they make claims that are false—cruelly false. When these concerns try to drum up trade by offering secret commissions to physicians they insult an honorable profession. The fact that they send out this sort of advertising matter is presumptive proof that there are some physicians who will patronize them. Such as do so are unfair to their patients and untrue to the ideals of medicine.

HYDROCYANIC ACID FROM DECOMPOSING PROTEINS

Some new questions relative to the significance of the finding of hydrocyanic acid in animal tissues are raised by observations just published from the departments of chemistry and bacteriology at the University of Kansas. Emerson, Cady and Bailey[1] have ascertained that certain micro-organisms living on protein mediums can evolve hydrocyanic acid. Clawson and Young[2] have identified the active agent in the cases investigated as the *Bacillus*

1. Emerson, H. W., Cady, H. P., and Bailey, E. S. H.: On the Formation of Hydrocyanic Acid from Proteins, Jour. Biol. Chem., 1913, xv, 415.

2. Clawson, B. J., and Young, C. C.: Preliminary Report on the Production of Hydrocyanic Acid by Bacteria, Jour. Biol. Chem., 1913, xv, 419.

pyocyaneus. This is, however, not the only organism found which can produce the volatile acid from proteins. The HCN-producing organisms do not liberate the poison in mediums containing free mineral acid. The facts here reported cannot fail to interest toxicologists who have scarcely been prepared to expect hydrocyanic acid as a substance liberated from decomposing proteins, though it has frequently been mentioned as a product of enzymatic reaction. The possible medicolegal bearings remain to be learned.

Medical News

ILLINOIS

Sanatorium Campaign Launched.—The Sisters of Mercy eight-day campaign for $100,000, which is to help pay for a home for girls and a sanatorium for the Home for the Aged, to be located in Aurora, was launched September 16. Already there has been $10,000 subscribed and Bishop Muldoon has promised that he would give $1,000 for every $10,000 raised by the people of Aurora and vicinity.

Personal.—Dr. Charles F. Sanborn, Chicago, has succeeded Henry L. Bailey as warden of the Cook County Hospital.——Dr. W. P. Woodard, Cherry Valley, sustained painful injuries of the wrist while leaping from a street car, September 12.——Dr. and Mrs. H. S. Worthley, Joliet, have returned from Europe.——Dr. Oscar B. Edmondson, Clinton, was operated on September 10 for appendicitis and is reported to be doing well.——Dr. Isaac Moore, Alton, suffered a cerebral hemorrhage at his home, September 9.

Chicago

Educational Campaign Against Tuberculosis.—The Chicago Tuberculosis Institute opened a two-week tuberculosis exhibit in Sherman Park, September 13. Health talks are being given each afternoon and evening to disseminate information regarding tuberculosis, its prevention and treatment.

Personal.—Dr. Clara Moore, for several years resident physician and pathologist in the North Chicago Hospital, has been appointed instructor in clinical medicine and diagnosis in the medical department of the University of Wisconsin, Madison.——Dr. and Mrs. William A. Evans left for the Northwest, September 17, on a lecture tour of Western Canada. They will return to Chicago about October 1.

MASSACHUSETTS

Floating Hospital Season Ends.—The Boston Floating Hospital has closed the busiest season on record. In the permanent wards 6,323 days' care were given to babies and 4,149 days' service to outer-deck patients. The work of the hospital on shore will be continued during the autumn and winter, as it was last year.

Personal.—The following associate medical examiners have been reappointed: Dr. John W. Pratt, Dedham, for Norfolk County; Dr. Francis E. Johnson, Erving, for Franklin County, and Dr. George A. Bancroft, Natick, for Middlesex County.——Dr. Stanton J. Ten Broeck, Orange, has been reappointed medical examiner for Franklin County.——Dr. Charles F. McCarthy, Winchester, has been appointed medical examiner of the Fourth Middlesex district.

Baby Hygiene Association Report.—George R. Bedinger, director of the Milk and Baby Hygiene Association, Boston, reported that during August 1,669 infants had been cared for by the association, an increase of 30 per cent. over August, 1912. The total of new patients cared for during the month was 317. There were forty-nine baby clinics held at the eleven milk stations of the association with a total attendance of 1,612. The association feels that funds should be raised to keep some of the stations open throughout the year.

MICHIGAN

New Hospital.—The new Manufacturers' Mutual Hospital, Detroit, was formally opened September 2. The institution has twelve beds and is provided with ample facilities for the treatment of accidents and emergencies.

Military Surgeons at County Society.—The Houghton County Medical Society at its monthly meeting September 1 had as its guests of honor the members of the Medical Corps of the Michigan National Guard on duty in the copper country. Major R. C. Apted, Grand Rapids, acting chief surgeon, read a paper on "Active Medical Service in the Field"; Major John V. Frazier, Port Huron, described the organization of the field hospital; Captain Ernest C. Lee, Detroit, spoke on the "Ambulance Company," and Captain R. J. Baskerville, Detroit, gave a detailed explanation of the use of the first-aid outfit, the general equipment, cooking of meals in the field, etc.

State Society Meeting.—The forty-eighth annual meeting of the Michigan State Medical Society was held in Flint, September 3-5. The following officers were elected: president, Dr. Guy L. Kiefer, Detroit; vice-presidents, Drs. H. E. Randell, Flint; E. C. Taylor, Jackson; E. H. Webster, Sault Ste. Marie, and R. H. Spencer, Grand Rapids; delegate to the meeting of the American Medical Association, Dr. E. T. Abrams, Dollar Bay; alternate, Dr. W. H. Hewlett, Detroit; members of the council, Dr. A. E. Bulson, Jackson, second district (reelected); Dr. R. S. Buckland, Baraga, twelfth district, succeeding Dr. A. J. Annis, Sault Ste. Marie, and secretary, Dr. F. C. Warnshuis, Grand Rapids (reelected).

NEW YORK

Tuberculosis Sanatorium Planned.—The State Department of Health has given permission for the operation of a sanatorium at Harrietstown, near Lake Placid, in the Adirondack Mountains.

Personal.—Dr. and Mrs. George F. Blauvelt, Nyack, have returned from Europe.——Dr. F. P. Hough, Binghamton, who was seriously injured in an automobile accident, September 1, is reported to be convalescent.

Medical College Will Build.—Although the Albany Medical College received only $10,000 instead of $100,000, as was expected in the will of the late Dr. John M. Bigelow, it will go on with the plans already made for the construction of the laboratory building. The Bigelow bequest provided for the establishment of the chair of laryngology and rhinology, and in addition the Bigelow stock in the college is to revert to the institution, the income to be applied for the best senior examination in diseases of the throat and nose.

Street Accidents in August.—The National Highways Protective Society in its last report shows that during the month of August there were in the state, outside of New York City, 13 persons killed and 161 injured by automobiles, 7 killed and 64 injured by trolleys, and 3 killed and 20 injured by wagons. In New York City during the month there were 47 persons killed and 204 injured in street accidents. Automobiles caused the death of 22 persons and injured 118, trolleys killed 13 and injured 53, while wagons killed 12 and injured 33. During the corresponding month last year automobiles caused 18 deaths, trolleys 13 and wagons 17.

New York City

Personal.—Dr. Francis O'Brien, ambulance surgeon of St. Mary's Hospital, Brooklyn, was seriously injured in an accident which wrecked the motor-ambulance of the hospital September 6.

Harvey Society Lectures.—The annual course of lectures under the auspices of the Harvey Society begins October 4 with a lecture by Dr. Augustus D. Waller, F. R. S., entitled "A Short Account of the Origin and Scope of Electrocardiography." Dr. Waller is a pioneer in animal electricity, was the first to record human electrocardiograms and brings with him his own apparatus, which he will demonstrate during the lecture.

To Increase County Society Membership.—The Special Committee on New Members of the Medical Society of the County of New York has sent out a letter to all members urging each to enlist at least one physician who is eligible to membership in the society. The membership at present is 2,515, and it is estimated that there are 1,500 additional physicians in the county who are eligible. While it is impossible for the committee to reach all these, it is believed that if the members take a personal interest in the matter the membership of the society can be considerably increased, even though it will lose 176 members through the formation of the Medical Society of the County of the Bronx.

The Service of Summonses by the Health Department.—Until recently summonses for the violation of the sanitary code have been served by a police officer attached to the Department of Health, but a resolution adopted by the Board of Health at its meeting on August 26 has changed this method of procedure. In order to facilitate the work of the inspector and to save him a trip to court he is permitted

to serve a summons immediately without consulting a magistrate. It had also been found in the past that a number of offenders against the sanitary code disappeared while the inspector was engaged in obtaining summons. This change in procedure has been made possible by a recent amendment in the Greater New York charter.

Typhoid Outbreak on East Side.—Less than a month ago the city was congratulating itself on having the fewest number of typhoid fever cases this year that have ever been recorded, while now it is alarmed over what is probably the worst epidemic of the disease that this city has experienced in fifty years. In the affected district 178 cases of typhoid fever have been reported since the first of the month. The district lies east of Third Avenue and between Third and Thirty-Third streets. Seventy-two of the reported cases are in Bellevue Hospital. The Health Department has traced the source of the infection to one milk supply and efforts are being made to locate the dairy from which the contaminated supply has been received. The Health Department offers immunizing treatment to all the members of families in which cases have developed, but it is said that the east-siders are not eager to take advantage of this offer.

NORTH CAROLINA

Personal.—Dr. W. I. Royster, Raleigh, who was seriously injured by being struck by a passing vehicle, is convalescent and is able to attend to business.——Dr. Hubert A. Royster, Raleigh, Drs. J. P. Munroe, C. M. Strong, A. J. Crowell and C. N. Peeler, Charlotte, have returned from Europe.

Insane Hospital Report.—The quarterly report of Dr. John McCampbell, superintendent of the Western Hospital for the Insane, Morgantown, shows the present number in the institution to be 1,342, with more than 300 applications on file. The new building for women, for which $50,000 was appropriated by the last legislature, is under construction and will offer accommodation to 150 patients.

PENNSYLVANIA

Personal.—Dr. Howard H. Bell, former intern at the City Hospital, Harrisburg, has accepted the position of demonstrator of pathology at the University of Alabama, Mobile.

Philadelphia

Memorial to Dr. Steinbach.—A new building for the Young Men's Hebrew Association will be erected as a memorial to Dr. Lewis W. Steinbach. Of the $100,000 fund to be raised for this purpose, $60,000 has already been subscribed.

Personal.—Dr. Henry E. Radasch, assistant professor of histology and embryology at Jefferson Medical College, has been appointed instructor of anatomy in the Pennsylvania Academy of Fine Arts to succeed the late Dr. George B. McClellan.

English Physicians in City.—Dr. Ralph Crowley, of London, and Dr. John Sinclair, of Essex, England, were the guests of Dr. Walter S. Cornell at City Hall, Philadelphia, September 16, where they were shown the local system of school medical inspection.

Diseased Throat Conditions Among Schoolchildren.—Among the pupils of the public schools, diseased throat and nose conditions rank second in number to decayed and diseased teeth. Recommendations to parents that these conditions be corrected in their children were made in 22,946 instances by medical inspectors during the last half of the 1912 school year, making 23 per cent. of all the recommendations made by the inspectors during that period.

Hospital Report.—The annual report of the Maternity Hospital at 734 South Tenth Street, recently issued, shows that in the thirty-seven years that the hospital has been in existence 3,896 babies have been born, with a record of only 211 deaths of infants and 38 deaths of mothers. This hospital cares for the woman before the period of her confinement, through the agency of the Midnight Mission, and after the birth of the baby the mother and child are sent to the Sheltering Arms and positions are obtained through the Children's Aid Society.

WEST VIRGINIA

Personal.—Dr. Charles B. McGlumphy, Moundsville, has returned from Europe. He has been appointed professor of bacteriology in the University of Texas, Galveston.——Dr. H. L. Gray has been appointed assistant physician at the State Insane Hospital, Weston, vice Dr. J. G. Pettit, resigned.

State Tuberculosis Exhibit.—The Antituberculosis League of West Virginia is about to send a car throughout the state with a free tuberculosis exhibit. It is the intention to visit one or more places in each county where lectures will be given and moving pictures shown relative to tuberculosis. The railways of the state have given a car and free transportation over their lines.

WISCONSIN

Hospital Notes.—The Board of Health of Racine has accepted for the city the new isolation hospital just completed. The building has cost $4,100 and has accommodation for eight to ten patients.

Visiting Nurses for Tuberculosis.—The first county visiting nurse in Wisconsin to take up tuberculosis work began in Milwaukee County September 15. Additional nurses will be employed as required.

New Officers.—Second District Medical Society, tenth annual meeting at Racine, September 5: president, Dr. George H. Young, Elkhorn; secretary-treasurer, Dr. Milton V. Dewire, Sharon. It was decided to hold the 1914 meeting in Walworth County.

State Society Meeting.—The annual meeting of the Wisconsin State Medical Association will be held in Milwaukee, September 29 to October 3.——On September 30 and October 1, the Wisconsin Medical Women's Society will hold its fourth annual meeting in Milwaukee, with headquarters at the Hotel Pfister.

Personal.—Dr. Belle P. Nair, Fort Atkinson, has been appointed resident physician at the Northern Hospital for the Insane, Oshkosh.——Dr. Robert Curtis Brown has been elected chief of staff of the Milwaukee Society for the Care of the Sick.——Dr. W. C. Bennett, Oregon, has been appointed physician to the State Reformatory.

Camps for Tuberculosis.—The State Board of Control recently visited Minocqua to look over prospective sites for the new tuberculosis camps, for the maintenance of which the state has made an appropriation of $10,000 a year.——The proposed Milwaukee County Tuberculosis Sanatorium at Wauwatosa is to cost not to exceed $396,000, and not $600,000 as originally called for by the plans.——The new Outagamie County Sanatorium near Kaukauna is nearing completion. The building is 136x72 feet, is of concrete and wood construction, and will accommodate about thirty patients.—— The fresh air camp established near Neenah for the summer was closed September 3.

University Establishes Bureau of Health Instruction.—The Extension Division of the University of Wisconsin has established a Bureau of Health Instruction for popular education in health and disease. According to the announcement, it is the purpose to extend this information on the part of the general public by means of lectures, publications, exhibits and correspondence. In the case of communities, surveys of existing conditions will be made, upon which working plans may be based for water system, sewage and general health regulation and administration. An exhibit is being prepared which will be sent from place to place throughout the state as opportunity and demand warrant.

GENERAL

Eye, Ear and Throat Men to Meet in Chattanooga.—The eighteenth annual meeting of the American Academy of Ophthalmology and Otolaryngology will be held in Chattanooga, Tenn., October 27-29. The address of the occasion will be presented by Colonel R. H. Elliott, I. M. S., Madras, India.

Propose Monument to Confederate Surgeon General.—At the meeting of the Association of Medical Officers of the Army and Navy of the Confederacy in 1909 it was proposed to erect a monument to the memory of Surgeon General James Preston Moore, C. S. A. This movement was indorsed by the United Confederate Veterans and by the Confederated Southern Memorial Association a year later. A monument committee has been appointed and it is proposed to erect the statue in Richmond, Va.

Meeting of Military Surgeons.—The twenty-second annual meeting of the Association of Military Surgeons of the United States was held in Denver, Colo., September 16-19, under the presidency of Surgeon William C. Braisted, U. S. N. The following officers were elected: president, Brigadier-General Charles Adams, N. G. Ill. (retired); vice-presidents, Lieut.-Colonel Jefferson R. Kean, M. C., U. S. A.; Surgeon General Rupert Blue, U. S. P. H. S., and Medical Inspector, George A. Lung, U. S. N.; secretary, Colonel Samuel C. Stanton, M. C., N. G. Ill. (reelected), and treasurer, Major Herbert A. Arnold, M. C., N. G. Pa. (reelected). The place and time for the 1914 meeting were left to the Executive Council with power to act.

Cumberland Valley Physicians Elect.—The Cumberland Valley Medical Society at its annual meeting held in Hagerstown, Md., September 4, elected the following officers: president, Dr. E. Roberts Plank, Carlisle, Pa.; vice-presidents, Drs. E. Tracy Bishop, Smithsburg, Md., E. S. Berry, Shippensburg, Pa., and John K. Gordon, Chambersburg, Pa.; secretary, Dr. John J. Coffman, Scotland, Pa. (reelected); assistant secretaries, Drs. J. Royer Laughlin, Hagerstown, Md., R. M. Shepler, Carlisle, Pa., and E. W. Palmer, Greencastle, Pa., and treasurer, Dr. H. C. Devilbiss, Chambersburg, Pa. It was decided to hold the next annual meeting in Cumberland County, Pennsylvania.

Bequests and Donations.—The following bequests and donations have recently been announced:

Seton Hospital, Spuyten Duyvil, N. Y., $15,000 by the will of Mrs. Mary H. Lawrence.

New York Orthopedic Dispensary and Hospital, $7,500 by the will of Marion DeForest Clark.

Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases, $20,000 by the will of Lucy Hunter Baird.

Presbyterian Hospital, Philadelphia, $55,000 by the will of Mrs. Jane McKee, Norris.

Worcester (Mass.) Memorial Hospital, $100,000 by the will of Mrs. Katherine Allen.

Mary Fletcher Hospital, Burlington, Vt., $25,000; Proctor Sanatorium, Pittsford, Vt., $10,000; Home for Aged Women, Burlington, Vt., $2,000; Home for Friendless Women, Burlington, Vt., $2,000; by the will of Charles B. Weatherby, Burlington, after the decease of the testator's wife and brother.

Albany Hospital, $10,000 by the will of Dr. John M. Bigelow, Albany.

The Third International Congress of Refrigeration.—The Third International Congress of Refrigeration, with an attendance of nearly two thousand delegates, over four hundred of whom were from abroad, met in Washington and Chicago, September 15 to continue until October 1. The opening meeting of the Congress was held in Washington where the delegates were welcomed by the President of the United States. After two days' sessions in that city the Congress moved to Chicago where the remaining meetings of the sessions were held. An exposition of refrigerating machinery and chilled products with methods of preserving and storing of food products was also held in connection with the Congress. In the six sections into which the Congress was divided, many papers were read relating to the chemistry and the mechanics of refrigeration. Transportation of chilled products, legislation, and allied subjects were also discussed. Among the papers of medical scientific interest read were the following: "Factors Influencing Changes in the Storage of Butter," "Bacterial and Enzymic Changes in Milk and Cream Kept at 0 C.," "Preservation of Eggs by Refrigeration," "Use of Refrigeration in the Preparation of Dried Cultures of Bacteria," "Effect of Prolonged Periods of Cold Storage on Bacteria in the Tissue of Fish," "Effect of Prolonged Cold Storage on the Chemical Composition of Fish," and "The Relation of Refrigeration to Biological Materia Medica." The chief interest of the Congress, however, was in the commercial, economic, and legal aspects of the refrigeration business and in the relation of the storage of foods to the food supply and the cost of living. Much of the time of the delegates to the convention was occupied in sightseeing and inspection of packing-houses, refrigerating and storage plants, etc.

Examination of Candidates for Assistant Surgeon.—Boards of commissioned medical officers will be convened to meet at the Bureau of Public Health Service, 3 B Street, S. E., Washington, D. C., and at the Marine Hospitals of Boston, Mass., Chicago, Ill., St. Louis, Mo., New Orleans, La., and San Francisco, Cal., on Monday, Oct. 20, 1913, at 10 o'clock a. m., for the purpose of examining candidates for admission to the grade of assistant surgeon in the Public Health Service, when applications for examination at these stations are received in the Bureau. Candidates must be between 23 and 32 years of age, graduates of a reputable medical college, and must furnish testimonials from two responsible persons as to their professional and moral character. Service in hospitals for the insane or experience in the detection of mental diseases will be considered and credit given in the examination. Candidates must have had one year's hospital experience or two years' professional work. Candidates must not be less than 5 feet 4 inches, nor more than 6 feet 2 inches, in height. The following is the usual order of the examinations: 1, physical; 2, oral; 3, written; 4, clinical. In addition to the physical examination, candidates are required to certify that they believe themselves free from any ailment that would disqualify them for service in any climate and that they will serve wherever assigned to duty. The examinations are chiefly in writing, and begin with a short autobiography of the candidate. The remainder of the written exercise consists of examination in the various branches of medicine, surgery and hygiene. The oral examination includes subjects of preliminary education, history, literature and natural sciences. The clinical examination is conducted at a hospital. The examination usually covers a period of about ten days. Successful candidates will be numbered according to their attainments on examination, and will be commissioned in the same order. They will receive early appointments. After four years' service, assistant surgeons are entitled to examination for promotion to the grade of passed assistant surgeon. Assistant surgeons receive $2,000, passed assistant surgeons $2,400, surgeons $3,000, senior surgeons $3,500 and assistant surgeon generals $4,000 a year. When quarters are not provided, commutation at the rate of $30, $40 and $50 a month, according to the grade, is allowed. All grades receive longevity pay, 10 per cent. in addition to the regular salary for every five years' service up to 40 per cent. after twenty years' service. The tenure of office is permanent. Officers travelling under orders are allowed actual expenses. For invitation to appear before the board of examiners, address "Surgeon General, Public Health Service, Washington, D. C."

CANADA

Personal.—Sir Ryckman Godlee, president of the Royal College of Surgeons of England, is expected in Toronto in November to deliver an address before the Academy of Medicine.——Dr. Harry Morrell, editor of the *Western Medical News*, Regina, has been appointed pathologist of the Regina General Hospital, with Dr. S. Rose as assistant.——Dr. Frederick Etherington, Kingston, Ontario, is one of a commission of three investigating the administration of jails in the province of Ontario.

New Officers.—The Saskatchewan Medical Society: honorary president, Dr. David Low, Regina; president, Dr. George R. Peterson, Saskatoon; secretary-treasurer, Dr. Arthur Wilson, Regina.——Prince Edward Island Medical Associataion, at Summerside: president, Dr. W. J. MacMillan, Charlottetown; secretary, Dr. J. C. Macdonald, Little York.——Aesculapian Society, Toronto: president, Dr. James M. Cotton; vice-president, Dr. Bruce L. Riordan; secretary, Dr. George Elliott; treasurer, Dr. Edmund E. King.

Hospital News.—An unknown individual has offered to build and equip a general hospital for Newcastle, N. B., at a cost of $25,000.——Regina, Sask., is erecting a new wing to its General Hospital.——An order of the Toronto Police Commissioners that all accident cases be immediately conveyed to the new Toronto General Hospital is causing considerable friction in that city.——Toronto is maintaining approximately 220 patients at regular hospital rates in the sanatoriums at Weston and Gravenhurst.

Quebec Sanitary Convention.—The fifth annual Congress of the Sanitary Services of the Province of Quebec was held in Montreal September 18 and following days. Dr. E. P. Lachapelle was the president. Dr. J. E. Laberge, M. O. H., Montreal, urged the necessity of those going to school being taught health matters. Dr. Arthur Simard of Quebec thought that 2,000 babies could be saved from death each year in that province by proper sanitary and hygienic measures. Public lectures were given by Dr. T. A. Starkey of McGill and Dr. C. N. Valin of Laval University.

Public Health in Quebec.—The Provincial Board of Health of the Province of Quebec was organized in 1881 with Dr. E. P. Lachapelle, Montreal, president, and Dr. E. Pelletier, secretary. After twenty-six years these officers still continue in their respective positions. To them is due the excellency of the public health acts of the province. In 1910 the province was divided into ten sanitary districts and six of these have been organized with medical inspectors in charge. These are required to have diplomas of public health and reside in their respective jurisdictions.

PARIS LETTER

(From Our Regular Correspondent)

PARIS, Sept. 9, 1913.

Statistics of the Medical Profession

Official statistics have just been published with regard to the number of physicians, dentists, midwives and pharmacists who practice in France. The département de la Seine, which includes Paris, is at the head of the list, with 4,393 physicians, 1,125 dentists, 1,329 midwives and 1,798 pharmacists. The département du Nord comes next with 811 physicians, 97 dentists, 422 midwives and 523 pharmacists. The lower

places in this statistical list are held by the départements des Hautes-Alpes, Haut-Rhin and la Lozère. In the Hautes-Alpes there are only 29 physicians, 2 dentists, 33 midwives and 14 pharmacists. Altogether, in France there are 20,809 physicians (making an average of one physician for 2,000 persons), 2,848 dentists, 13,066 midwives and 11,585 pharmacists.

A Monument to Dr. Henry Cazalis

On September 7, in the little cemetery of Ferney, near Geneva, but on French soil, a monument was erected to Dr. Henry Cazalis, known in literature under the pseudonym of Jean Lahor. He was born in 1840 and died in 1909 in Switzerland; but as he wished his remains to rest on French soil, the cemetery of Ferney, the little village where Voltaire once lived, was chosen. Jean Lahor wrote several volumes of poetry, but in the last years of his life the spirit of apostleship awoke within him and he dreamed of a society reinvigorated by social hygiene and popular sense of beauty. Abandoning poetry, he wrote works on science and marriage, cheap foods, cheap dwellings, etc. He also contributed to the popularization among us of the esthetic ideas of the English poet, William Morris.

BERLIN LETTER

(From Our Regular Correspondent)

BERLIN, Sept. 5, 1913.

Personal

K. Buerkner, professor of otology in Göttingen, died on a vacation trip in the Tyrol, September 2, aged 60. He began as privat-docent and director of a policlinic for ear diseases in Göttingen in 1877. In 1885 he was appointed professor extraordinary. His most important works are the "Text-book of Otology" and an atlas of pictures of the membrana tympani. He also assisted in the preparation of a number of compilations and was an associate editor of the *Archiv für Ohrenheilkunde*.

Geheimrat von Baelz died September 1, after a long sickness at Stuttgart, at the age of 64. After having been assistant to the renowned Professor Wunderlich of Leipsic in 1871 and 1872, he accepted in 1875 a call to the Japan Medical School at Tokio, where he first taught physiology and afterward occupied the chair of medicine and gynecology. At the same time he was body surgeon of the crown prince, the present mikado. With reference to the illness of the latter, with which the press was full a few weeks ago, he published an account in the *Deutsche medizinische Wochenschrift* of the illness for which he had treated the Japanese ruler in his time, but with some reservation on account of his previous confidential relation. I can disclose that in his youth the mikado was treated by Baelz for a peculiar form of pulmonary tuberculosis, which later healed completely.

After nearly thirty years of activity in Japan (he married a Japanese lady there), Baelz returned to his home in Stuttgart and devoted most of his time to scientific employment. In 1908 on the invitation of the imperial family he visited Japan for a time. In addition to a long treatise on the side effects of salicylic acid, he prepared a text-book on internal medicine, especially for his classes, and devoted much attention to anthropologic and pathologic conditions and published some very interesting articles on these subjects.

Postgraduate Courses on Social Medicine

By decree of the minister of the interior the provincial presidents throughout Prussia are required to establish medical postgraduate courses in social medicine in their respective provinces. The participants in these courses are then expected on their part to give lectures and exercises in the societies for their neighboring colleagues. The courses will be given financial aid by the government provided that the medical chambers *(Aerztekammer)* interested will appropriate additional funds. As an introduction to these courses, a twelve-day course will be held in Berlin this autumn for those physicians who are to deliver the lectures in the provincial courses.

Hamburg to Loan Radium and Mesothorium to Physicians

A bureau for the distribution of radium and mesothorium has been founded in the Hamburg institute for cancer and tuberculosis research which was founded a short time ago. The object is to secure as large a quantity of these preparations as possible in a short time and place them at the disposal of the public. At present about 150 mg. of radium bromid are on hand; this quantity is to be doubled in about two weeks and there is a prospect of securing further amounts. The preparations are to be loaned to physicians.

Diphtheria in Prussia, 1902 to 1911

The morbidity from diphtheria in Prussia increased from 54,848 in 1905 to 83,821 in 1910, and in Berlin from 1,485 in 1902 to 6,061 in 1910. The number of deaths from diphtheria in Prussia decreased from 14,175 in 1902 to 9,683 in 1910, but in Berlin they increased from 239 in 1902 to 695 in 1910. Calculated for 10,000 living, the relative number of cases in Prussia increased from 15.41 in 1902 to 20.87 in 1910, and that in Berlin from 7.68 in 1902 to 28.58 in 1910. The relative number of deaths in Prussia fell from 4.05 in 1902 to 2.45 in 1910, while in Berlin in the same time it rose from 1.25 to 3.11.

Marriages

JANVIER WHITTON LINDSAY, M.D., Washington, D. C., to Miss Catherine Armyn Crabill, of San Antonio, Mo., July 10.

NATHAN B. EDDY, M.D., to Miss Wilhemina E. Ehrens, both of New York City, at Glens Falls, N. Y., September 7.

ALBERT WEST METCALFE, M.D., Mobile, Ala., to Miss Anne Porter Kolb of Birmingham, Ala., September 10.

LEWIS BOOKER, M.D., New Castle, Del., to Miss Kathleen M. Flannagan of Charlottesville, Va., September 3.

CHARLES P. MCKEE, JR., M.D., to Miss Pearl Catherine Losher, both of St. Marys, Ohio, September 4.

ALBERT BUTLER STONE, M.D., Lamar, Mo., to Miss Bessie Wood Ross of Pilot Grove, Mo., August 21.

WALTER E. CASWELL, M.D., Brockton, Mass., to Miss Annie S. Cameron, of Halifax, N. S., September 2.

ELMER W. MOSELY, M.D., Lincoln, Neb., to Miss Etta Frances Brothers of Chicago, September 3.

CHARLES ARTHUR BOYD, M.D., Belpre, Kan., to Miss Cora Belle Klein of Iola, Kan., September 10.

CHARLES H. SHRODER, M.D., Duluth, Minn., to Miss Helen Blau of Covington, Ky., August 23.

RUSSELL V. THOMAS, M.D., Manteno, Ill., to Miss Cora Lambird of Newton, Ill., September 10.

ALBERT K. DETWILLER, M.D., to Miss Margaret O'Dowd, both of New York City, September 6.

R. L. CARR, M.D., Greenville, N. C., to Miss Elizabeth Pugh of Arkansas, Ark., September 3.

SYDNEY WALKER, JR., M.D., to Miss Isabelle Clarke Irwin, both of Chicago, September 16.

WALTER T. BRONSON, M.D., to Miss Laura May Graham, both of Pueblo, Colo., September 2.

Deaths

Edwin Wilcox Bartlett, M.D. University of Vermont, Burlington, 1866; a fellow of the American Medical Association; for forty-three years a specialist in diseases of the eye and ear, of Milwaukee, and for thirty-eight years local surgeon for the Chicago, Milwaukee and St. Paul Railway; emeritus professor of ophthalmology and otology in the medical department of Marquette University; from 1886 to 1889 a member of the school board and from 1894 to 1900 a trustee of the Milwaukee Public Museum, for four years serving as president of the board; died at his home in Milwaukee, September 11, aged 74.

James Milton Blaine, M.D. Jefferson Medical College, 1881; a member and once secretary of the Colorado State Medical Society; secretary of the Dermatological Section of the American Medical Association in 1899; professor of dermatology and venereal diseases in the Denver and Gross College of Medicine; dermatologist at St. Anthony's and the Denver County Hospital, Mercy Sanatorium and the Jewish National Hospital for Consumptives; editor of *Colorado Medicine;* died at the home of his daughter in Carnegie, Pa., September 7, from cerebral hemorrhage, aged 58.

Richard Van Santvoord, M.D. Bellevue Hospital Medical College, 1875; of New York City; a fellow of the American Medical Association, the American Academy of Medicine and The Harvey Society; visiting physician to the Harlem Hospital; died in the Presbyterian Hospital, New York City, September 10, two days after a surgical operation, aged 60.

Walter Millard Fleming, M.D. Albany (N. Y.) Medical College, 1862; a specialist in nervous maladies and insanity, of New York City, for forty years; once health officer of Rochester, N. Y.; surgeon of the Thirteenth New York Volunteer Infantry and later of the Third Brigade, N. G., N. Y., during the Civil War; one of the founders of the Order of Nobles of the Mystic Shrine; died at the home of his son in Mount Vernon, N. Y., September 9, aged 75.

George C. Laws, M.D. University of Pennsylvania, Philadelphia, 1871; a member of the Medical Society of the State of New Jersey; one of the promoters of the Paulsboro (N. J.) National Bank; died at the home of his son in Philadelphia, September 5, aged 68.

Benjamin Franklin Severs, M.D. Long Island College Hospital, Brooklyn, N. Y., 1888; a member of the Medical Society of the State of Pennsylvania; for two terms a member of the Philadelphia School Board; died at his home in Philadelphia, September 5, aged 57.

Augustus Christian Hetrick, M.D. Eclectic Medical Institute, Cincinnati, 1858; president of the Wellsville (Pa.) National Bank and for more than half a century a practitioner of York County, Pa.; died at his home, September 4, from acute gastritis, aged 78.

Mortimer M. Taplin, M.D. McGill University, Montreal, 1892; a fellow of the American Medical Association and a member of the Rochester (N. Y.) Pathological Society; died in the Rochester General Hospital, September 9, from pneumonia, aged 45.

James Franklin Eddington, M.D. Louisville (Ky.) Medical College, 1878; a member of the Illinois State Medical Society and local surgeon at Enfield for the Louisville and Nashville Railroad; died at his home, September 1, from heart disease.

Charles Joseph McFadden, M.D. University of Pennsylvania, Philadelphia, 1891; a member of the Medical Society of the State of Pennsylvania; died at his home in Pittston, September 3, after an illness of two years, aged 44.

William Van Buren Ezell, M.D. University of Louisville, Ky., 1872; for more than forty years a practitioner of Brazoria County, Tex.; died at his home in Angleton, August 26, from nephritis, aged 62.

J. Waller Ford, M.D. Medical College of Virginia, Richmond, 1876; of Hinton, W. Va.; while watering his horse at Talcott, W. Va., September 4, was kicked in the forehead and died two hours later, aged 57.

John E. Gruber, M.D. Medical College of Fort Wayne, Ind., 1882; for more than thirty years a resident of Isabella Co., Mich.; died at his home in Shepherd, August 31, from cerebral hemorrhage.

Reuben B. Keeran, M.D. Eclectic Medical Institute, Cincinnati, 1879; for twenty-seven years a practitioner of Hancock County, O.; died at his home in Findlay, September 5, from asthma, aged 60.

James Augustus Coyne, M.D. Jefferson Medical College, 1896; of Newark, N. J.; died at his summer home in Sterling, Mass., September 8, from heart disease, aged 60.

Owen A. Palmer, M.D. Hahnemann Medical College, Chicago, 1884; formerly of Warren and Cleveland, Ohio; died at his home in Akron, Ohio, August 21, aged 65.

Edward Worcester, M.D. New York University, New York City, 1851; for 53 years a practitioner of Waltham, Mass.; died in his home, September 2, aged 83.

Charles Hamilton Ballantine, M.D. Jefferson Medical College, 1882; of Philadelphia; died in the Jefferson Hospital in that city September 8, from dropsy, aged 56.

E. H. Fordtran, M.D. Fort Worth (Tex.) University, 1911; formerly of Fayetteville, Tex.; died in San Angelo, Tex., September 3, from tuberculosis, aged 25.

John Russell Morris (license, Nebraska, 1909); a resident of Richardson County, Nebraska, since 1878; died at his home in Humboldt, September 2, aged 63.

Mott J. Gillam, M.D. Bennett Medical College, Chicago, 1886; died at his home in Florence, Kan., July 2, from cerebral hemorrhage, aged 48.

Thomas H. Frey, M.D. Memphis Hospital Medical College, 1899; died at his home in Beaumont, Tex., September 6, from nephritis, aged 48.

Lewis G. Tandy, M.D. Washington University, St. Louis, 1886; died at his home in St. Louis, August 28, from meningitis, aged 51.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

SINKINA

Report of the Council on Pharmacy and Chemistry

Sinkina is a malaria "cure" put on the market by the Metropolitan Pharmacal Company, New York. The product was presented to the Council on Pharmacy and Chemistry for admission to New and Nonofficial Remedies and was rejected because insufficient evidence was submitted to substantiate the improbable claims made for it. The manufacturers were sent a copy of the report stating that their product was refused recognition. In view of the advertising that was persisted in after its rejection, the Council's referee for Sinkina submitted the preparation to clinical tests. Both the original report and the results of the clinical tests are given in the following report, which was submitted to the Council and recommended for publication. The complete report having been sent to the manufacturers and their reply considered, the Council authorizes its publication. W. A. PUCKNER, Secretary.

THE COUNCIL'S FIRST REPORT

The Council, after investigating the claims made for Sinkina, declared the product unworthy of recognition and adopted the following report, which was sent to the manufacturers:

No experimental evidence regarding the therapeutic value has been submitted. The clinical evidence is scant and not of such character as to deserve much consideration, no sufficient precautions having been adopted to avoid wrong conclusions. Judging from the evidence at hand the preparation is simply a dilute sugar-alcohol-water solution containing a little oil of cumin—Roman caraway. It is highly improbable that such a liquid would have the therapeutic effects claimed for it by the Metropolitan Pharmacal Company. In view of the improbable claims made for Sinkina, and the failure to substantiate them by suitable evidence, it is recommended that the preparation be refused recognition without at this time considering the claims made in regard to the identity and amount of the drug claimed to be the essential constituent.

In spite of its rejection Sinkina was persistently advertised. It was thought advisable, therefore, to submit the preparation to clinical tests. This was done and the results are given in the following report:

THE CLINICAL REPORT

The following quotations indicate the claims made for this preparation:

"In malarial conditions there is nothing that acts so promptly and efficaciously as Sinkina. Sinkina destroys radically every trace of the parasite in the blood from the time of its first appearance, builds up the damaged corpuscles, revitalizes the system, and completely eliminates every trace of the disease. Sinkina is deservedly termed the *Specific* for Malaria."

These claims were supported by testimonials which usually gave no indication of a demonstration of the presence or absence of malarial plasmodia in the blood. The following is an example showing the character of most of the evidence presented by the manufacturers:

"Three weeks ago I prescribed Sinkina for a negro man 40 years of age suffering from a double tertian malarial infection having a chill every afternoon for four consecutive days. He came to my office about 8 a. m. and was due to have a chill about 6 p. m. I gave him the sample of Sinkina and directed him to take a tablespoonful at once also at noon and again at 4 p. m., and to continue taking it in same size dose three times a day till he had taken it all. He reported to me in a week from that date and told me he was feeling fine and that he hadn't had any more chills. The patient up to this time is apparently cured."

As the claims were supported by a few testimonials purporting to be based on exact investigations, the Council submitted the preparation to careful laboratory and clinical tests. For this investigation the Council was fortunate in securing the help of physicians actively engaged in the study of malaria.

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Experiments were made *in vitro* with the preparation; 1 ounce of Sinkina was used, and its action was compared with that of 10 grains of quinin sulphate. When these were added to cultures of malarial plasmodia in proportion corresponding to 1 ounce of Sinkina or 10 grains of quinin sulphate for a 150-pound man, the quinin was found to be unfailingly antagonistic to the malarial organism, the drug prevented the segmentation of the organism and finally killed it in about thirty-six hours. The Sinkina did not kill the parasite after seventy-two hours of continued action, and the parasites segmented in the presence of it just as actively as they did in the control.

The investigator was furnished with two sets of preparations in plain prescription bottles so as to avoid all influence of the personal equation. One set consisted of Sinkina, the other of a mixture of alcohol, sugar and water with some oil of cumin. The investigator reported that, so far as the tests on the cultures of malarial plasmodia were concerned, he could not determine any difference in the results obtained with the oil of cumin preparation, made in the laboratory of the Association, and those obtained with the Sinkina of the Metropolitan Pharmacal Company. Clinical trials were made by three independent investigators. Two of them received the two sets of preparations described.

FIRST INVESTIGATION

The first investigator treated two cases with Sinkina: one was of the ordinary estivo-autumnal type and the other an ordinary tertian.

CASES 1 AND 2.—A good many schizonts were present in the blood of each patient forty-eight hours after the administration of Sinkina. In the instance of the case of tertian the patient had his chill forty-eight hours after the medicine had been started. As the Sinkina failed to produce any effect the patients were then put on quinin to stop the disease.

CASE 3.—The patient had taken 10 grains of quinin on the day on which the experiment was begun. He had the tertian form of the disease, and plasmodia were quite numerous at the beginning. The quinin was discontinued and Sinkina was given in doses of 1 ounce three times a day. The day following the administration of 10 grains of quinin and 1 ounce of Sinkina, no parasites could be found in the blood. The Sinkina was continued in the doses mentioned. On the seventh day the patient had another chill, and a great many parasites were found in his blood. The Sinkina was discontinued and the patient was at once relieved by quinin.

This investigator gives it as his opinion, based on these observations, that the preparation (Sinkina) is absolutely worthless in the treatment of malaria, and he does not think it necessary to make any further experiments with it.

SECOND INVESTIGATION

The second investigator treated two cases of tertian malarial fever with these preparations until it was satisfactorily proved that the drug was having no effect on the presence of the parasites in the blood, when he began the administration of quinin.

CASE 4.—After the use of the remedies for one week the investigator still found young rings half-grown and gametes present in the blood. Apparently there was a relative increase in the number of parasites. He then began the administration of quinin. Blood-smears taken the next day after 40 grains of quinin had been taken showed one parasite after eighteen minutes' search of one slide, and two after thirty minutes' search of a second slide. At the end of a week's treatment the patient was discharged recovered. The blood examination of two slides was negative.

CASE 5.—This was a case of tertian malaria. After treatment for five days with Sinkina the blood still showed tertian parasites with increase in the size of the spleen, and the preparation was without effect on the clinical course of the disease. Quinin was then begun, and the blood examination became negative at the end of three days.

The investigator concludes that the preparations furnished him were absolutely worthless in the treatment of two cases of the tertian form of malarial fever, and that these solutions had no effect on the presence of the parasites in the peripheral circulation. In a case of quartan malaria, both of the preparations (cumin oil mixture and Sinkina), sent by the Association Laboratory, were without effect on the plasmodia in the blood. This investigator employed the solution made by the Association Laboratory (cumin oil mixture) as well as Sinkina, and was unable to note any differences between them.

THIRD INVESTIGATION

The third investigator began the trial of Sinkina at the instance of the manufacturers, and used it in three cases, two of them being benign tertian malaria and one case of mixed infection (benign tertian and estivo-autumnal).

CASE 6.—This was one of the cases of benign tertian malaria. The patient gave a clinical history of malaria with chills occurring on alternate days for a little over a week. There was an immediate cessation of all clinical symptoms, and three days after the patient had been on ½ ounce of Sinkina three times daily there was no evidence of any plasmodia in his blood; his additional treatment consisted of 5 grains of calomel the evening of the first day with a saline the next morning. Before the patient was put on treatment, numerous parasites of both the asexual and sexual forms were observed. The patient remained in bed for a few days, and then returned to work. A week later he was again taken ill with a return of all of his previous clinical symptoms.

CASE 7.—This case was one of mixed infection (benign tertian and estivo-autumnal). The patient had a clinical history of malaria dating back two weeks, with a maximum temperature of 104 on admission. Tertian rings, estivo-autumnal rings and crescents were found in the blood. The patient was placed in bed, given thorough eliminating treatment, and ½ ounce of Sinkina was administered four times daily. His clinical symptoms ran on for two days with no change, and there was no difficulty in finding the plasmodia in blood-smears, which were taken twice daily. The dose was then doubled and at the end of four days more there was no change in either his clinical symptoms or the blood-findings. The patient was then placed on 10 grains of quinin sulphate with 15 drops of diluted hydrochloric acid three times daily, to which he responded in less than forty-eight hours and made an uneventful recovery.

CASE 8.—This was the other case of benign tertian malaria. The patient had chills every other day while on the treatment, and laboratory diagnosis confirmed the clinical findings. Experimental treatment was carried on for four days, with a negative result.

The investigator calls attention to the fact that the first case in which improvement resulted does not show any necessary connection with the Sinkina administered, for many cases of benign tertian will clear up in just as short a time under any line of treatment, while practically all will eventually do so. This investigator later reported another case and transmitted a clinical chart.

CASE 9.—This patient was admitted to the hospital, Dec. 30, 1912, with a history of having had malaria for some weeks. The diagnosis was confirmed by a blood examination. He was then carried for four days without treatment other than rest in bed and a liquid diet. His symptoms subsided by the third day. On the fourth day a count of the parasites was made which showed that there were 1,160 asexual parasites and 260 sexual forms to every thousand leukocytes. The following day he was placed on Sinkina, 1 ounce three times daily. There was exacerbation of symptoms on the following day, which gradually increased until the fourth day, remaining about stationary for a day or so. The fifth day after the patient had been placed on Sinkina, another count of the parasites showed 5,600 asexual parasites and 300 sexual forms to the thousand leukocytes, this being an increase of 4,440 asexual forms and forty sexual forms to every thousand leukocytes. With the second count of parasites the dose of Sinkina was increased to 2 ounces every four hours, the patient being kept on this until January 14, without result. He was then placed on quinin, with a complete reduction of the temperature to normal and the disappearance of the parasites from the blood.

The investigator also reported a case of benign tertian malaria.

CASE 10.—This was in a child of 8 years which was treated by the investigator's confrère and gave similar negative results. Blood examination showed numerous parasites. The

child was placed on 1 ounce of Sinkina three times a day and kept on it for two weeks. The clinical picture remained unaltered, and parasites could be detected in numbers whenever examinations were conducted. A gradually increasing enlargement of the spleen was also noted. At the end of two weeks quinin was substituted, and the child went on to a rapid and uneventful recovery.

This investigator also concludes that the claim put forth by the Metropolitan Pharmacal Company that Sinkina is a specific in the treatment of the malarial fevers is entirely without foundation, and that the firm will be unable to demonstrate to the contrary.

These investigations demonstrate that Sinkina is not a specific against malaria, and that it has no more effect than a mixture of oil of cumin, sugar, alcohol and water. They further show the fallacy, first, of concluding from a temporary cessation of the symptoms in malaria that the disease has been cured and, second, of ascribing such temporary improvement to the influence of a remedy which has no known effect on the malarial organism.

Correspondence

Creeping Eruption

To the Editor:—I have noted the publication of reports of two cases of creeping eruption (THE JOURNAL, July 26, 1913, p. 247), by Dr. Gustave L. Rudell, in one of which, in August, 1912, he was able to recover the larva. In view of the fact, as stated therein, that recovery of the parasite producing this lesion is exceedingly rare, only two investigators having previously reported finding it, it might be of interest to report that in August, 1910, I succeeded in recovering two of these organisms from such a case while in hospital work in Philadelphia. I had not reported the case prior to this writing, since that part of the limited literature on the subject which had come under my observation had not before impressed me with the fact that the demonstration of this organism in connection with these cases was of such rare occurrence as is apparently true.

My notes show that both parasites found by me were practically the same as to shape, size and body markings as a specimen represented in a drawing after Sokolow, in Pusey's text-book—which was reproduced in THE JOURNAL of July 26—with the single exception that ring markings of the body in these specimens were not fully visible except near the head; there was a general motility of the body of a slight degree. The two larvae in question were recovered from the right forearm as small black dots, barely visible to the naked eye, and embedded in the cuticle at points of intense itching.

In this case it was notable that there was practically no difficulty encountered in finding and extracting the larvae, which were picked from the skin along with small scale-like particles of cuticle by the crude method of using the nails of thumb and forefinger, and in these two instances the small mass thus obtained was placed on a slide moistened with water for microscopic examination; patient himself in my presence later picked a third one from this forearm which was not examined microscopically. It was likewise worthy of note that there was no eruption of a distinctly "creeping" nature in this case, but at each of the three isolated points of itching, which alone drew patient's attention to the condition, there was a small erythematous area (no doubt intensified by scratching the parts) in the center of which was a slight scaly puckering of the epidermis containing the black dot.

Patient stated that he had been conscious of itching for only a few hours before I saw him and later informed me that he was aware of no further symptom of this kind after removal of the larvae. I might further add that he had just previously spent several days at the seashore, frequently in surf-bathing, at which time the larvae were probably deposited on his forearm.

THOMAS H. CATES, M.D., Little Rock, Ark.

Lactobacilline—A Reply

To the Editor:—May we call your attention to what is doubtless an unintentional injustice done our product, Lactobacilline Liquide, in the Queries and Minor Notes Department of THE JOURNAL, Aug. 23, 1913, p. 618? In your note you refer to an article by Professor Heinemann, dated Jan. 30, 1909, stating that yeasts were found in the product of the Franco-American Ferment Company as sold in the form of powder and tablets and that "Sewerin also failed to find *B. bulgaricus* in Lactobacilline."

The Lactobacilline preparations examined by Professor Heinemann were imported and were foreign products obtained previous to the time when the Ferment Company of New York manufactured Lactobacilline. The Lactobacilline referred to by Sewerin was examined by him in Russia and was not manufactured in America. His report was published in the *Centralblatt für Bakteriologie*, November, 1908, and was merely referred to in THE JOURNAL, Jan. 27, 1912. Evidently, therefore, the criticisms of Heinemann and Sewerin do not apply to the Lactobacilline products which we sell.

As to the query propounded by your correspondent regarding Professor Metchnikoff's supervision of the Franco-American Ferment Company's preparations, we wish to give the following information: Once a month samples of all Lactobacilline products made in this country are bought at random in the open market by an independent law firm which acts as attorney for Professor Metchnikoff and La Societé Le Ferment. These are sent to Paris for examination. If they are not found to conform to Professor Metchnikoff's scientific requirements, *ipso facto*, we lose the right to use his name in connection with the products.

When under the authorization of Professor Metchnikoff we first put the Lactobacilline products on the American market, the therapeutic efficiency of the *Bacillus bulgaricus* in the various forms of auto-intoxication was but little known to the profession and we felt compelled to enclose printed matter in our packages. This, we were led to believe, made our products unacceptable to the Council on Pharmacy and Chemistry under its rules. It was for this reason solely that the Lactobacilline products have not heretofore been submitted to the Council and we wish to take this opportunity of stating that steps have been taken to submit these products to the Council on Pharmacy and Chemistry in the belief that they will be found acceptable for inclusion in New and Nonofficial Remedies.

THE FRANCO-AMERICAN FERMENT CO.,
by Joseph C. Richard, Vice-President.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

STATES IN WHICH GOVERNMENT PHYSICIANS MAY REGISTER WITHOUT EXAMINATION

To the Editor:—In what states, if any, are medical officers of the United States Army, Navy and Public Health Service (on the active list, retired or resigned) allowed to register, without taking the regular state board examination? Please omit my name in answering. E. M. D.

ANSWER.—The following states have taken legislative action in this regard:

1. Alabama grants a certificate to practice to any such officer on the active list, provided he can produce evidence as to his still being in the service.

2. California allows the medical officers of the Army and Navy, whether on the active list, retired or resigned, to practice in that state on a proper showing that they are or were duly commissioned, and on paying a fee of $50.

3. Illinois permits the State Board of Health to use its discretion in issuing licenses without requiring an examination to any physician who is a graduate of a medical college and who

has passed an examination before the United States Army, Navy or Public Health Service.

4. North Dakota allows the experience which any one has gained in the Army, Navy or Public Health Service to be given due consideration. The board may in its discretion license such officers without an examination on paying a fee of $25 and producing proper credentials as to their service, etc.

5. Texas permits surgeons and such officers of the United States Army, Navy or Public Health Service to engage in private practice if a license to do so is first obtained from the board.

The majority of states, it would seem, permit such officers to practice only in the line of their official duties. In a few states the language of the statutes might be construed to imply that government medical officers may practice without being first licensed. An example of this is Iowa. Its statute says that the act is not to apply to surgeons of the United State Army, Navy and Public Health Service. It does not say that this is simply in the line of their official duties. It may therefore be inferred that such officers may practice privately. Kentucky, Louisiana, Maryland, Tennessee and Wisconsin have similar language in their laws. The New York statute exempts such officers "while so commissioned." This would seem to imply that such officers may practice privately while still commissioned.

WEICHARDTS' ANTIKENATOXIN — BAUME ANALGESIQUE BENGUE

To the Editor:—1. What is Weichardts' Antikenatoxin? A paper was read on the use of this substance at the recent congress in Buffalo.

2. What is the composition of Baume Analgesique Bengue? Is there any official preparation of similar constituents?

S. T. A., New York.

ANSWER.—1. We have no information in regard to Weichardts' Antikenatoxin.

2. Analyzed by the British Medical Association this "patent-medicine"-"ethical-proprietary" was found to have the following composition (THE JOURNAL A. M. A., Dec. 14, 1912, p. 2173):

Menthol	18 per cent.
Methyl salicylate	20 per cent.
Lanolin, anhydrous	54 per cent.
A fat, apparently lard	8 per cent.

No similar preparation is described in the United States Pharmacopeia or in the National Formulary, but the British Pharmaceutical Codex, gives the following:

Unguentum methylis salicylatis compositum B.P.C.		
Methyl salicylate, by weight	50.00	(10 ounces)
Menthol	10.00	(2 ounces)
Eucalyptol, by weight	2.50	(½ ounce)
Oil of cajuput, by weight	2.50	(½ ounce)
White beeswax	17.50	(3½ ounces)
Hydrous wool-fat	17.50	(3½ ounces)

Mix the wool-fat with the melted beeswax, gradually incorporate the menthol and liquids, previously mixed by trituration, and stir until cold.

SEASHORE SANATORIUM

A correspondent asks us for the address of "one or more sanatoriums located at or near the seashore, either on the Eastern or Southern coast." We shall be glad to receive information for our correspondent regarding such sanatoriums.

OXYOLINE AND OZONE MACHINES

To the Editor:—What about the Oxyoline (ozone) machine that a number of our doctors are using? I had always supposed that it was a fad on a par with the nebulizer and other such stuff that we have seen come and go. Lots of it is now piled up in physicians' offices all over the country. An agent for the Oxyoline outfit was here yesterday to see me, however (and I don't mind telling you that he is about as smooth an article as ever "came down the pike"), and showed me letters from some of our best men (some of them members of our state society and of the American Medical Association), who make some very big statements in regard to the curative properties of ozone. If there has been anything published in regard to these people in THE JOURNAL, please tell me where to find it. Also anything that you know about this outfit. On its face this proposition doesn't look good. Any advice will be appreciated.

F. P. STEVENSON, M.D., Aurora, Mo.

ANSWER.—The subject of ozone machines is dealt with both in the editorial and in the original article departments of this issue. The "Oxyoline" machine was discussed in THE JOURNAL, Nov. 11, 1911, page 1629. The concern which exploits it has made claims that are not only unscientific but absolutely fraudulent. The apparatus itself is being used in various places as an accessory to quackery. The main points emphasized by the manufacturers of the Oxyoline machine are not those of therapeutic efficiency of the device, but the money-making possibilities in it.

Medical Economics

THIS DEPARTMENT EMBODIES THE SUBJECTS OF POST-GRADUATE WORK, CONTRACT PRACTICE, LEGISLATION, MEDICAL DEFENSE, AND OTHER MEDICOLEGAL AND ECONOMIC QUESTIONS OF INTEREST TO PHYSICIANS

PRACTICAL NEWSPAPER COOPERATION

The value of intelligent cooperation on the part of the newspapers in saving life is well shown by a letter and two editorials, recently received from Mr. William L. Geppert, editor of the *Daily Telegram*, of Clarksburg, W. Va. Mr. Geppert, as a public-spirited newspaper man, was impressed with the need of wide-spread publicity of editorials in recent issues of THE JOURNAL on "Suicide with Bichlorid of Mercury." These editorials, distributed by the Association Press Bureau to the newspapers, have been widely copied. Mr. Geppert, however, not only reprinted the editorials, for the information of his readers, but also suggested a practical way in which the newspapers can cooperate, that is, by making it an inflexible rule to omit from newspapers all mention of the means by which self-destruction was accomplished. Mr. Geppert's editorials are worthy of reproduction, as an illustration of the value of newspapers in the campaign for better health conditions.

The first editorial was entitled:

"PROMOTING DEATH

"For the sake of despondent and melancholic humanity, the *Telegram* desires to 'call down' a newspaper correspondent of Fairmont for telegraphing to various newspapers the kind of poison that was swallowed by a child there a day or two ago by mistake and that resulted in the child's death; and also the name of the poison taken by a man there last evening with suicidal intent. The *Telegram* also desires to condemn the Wheeling newspapers that chronicled the names of the poisons in headlines over the same items, and other newspapers that published the items without eliminating the name of the poison. And, further, the *Telegram* desires to lay down a rule to be followed by newspapers in publishing news items of suicides, accidental deaths and other like tragedies caused by poisons, namely, to eliminate the name of the poison.

"Not so very long ago, as will be readily recalled, a Georgia banker died of a poison taken in mistake; and the name and the nature of the poison were heralded from one end of the land to the other with what was declared to be not altogether an accurate account of its effects. Immediately thereafter a wide-spread series of suicides from this same poison occurred throughout the country; and cause and effect were so obvious as to lead THE JOURNAL of the American Medical Association to enter a vigorous protest against the publication of such cases altogether.

"While it is probably too soon to expect any notable decrease in the endless publication of ordinary crimes and tragedies with which newspapers are half filled nowadays to no good purpose, it is not too soon to begin a campaign against the unwitting advertisement of poisoning methods—against a promotion of death and destruction that would scare the consciences of many persons when brought to realize its actual significance. Accounts of suicides, especially, should be so judiciously edited as to offset the direful effects resulting through mental suggestion on weak, ignorant, despondent and afflicted persons.

"In regard to the poisoning cases at Fairmont, commendation is due the Associated Press for flatly refusing to carry the names of the poisons in its stories of the fatalities."

In the second editorial, the editor makes an exception to his own rule, for very good reasons. He says, under the heading:

"AN AGONIZING DEATH

"It is a rule of the *Telegram*, as well as other respectable journals and great news-dispensing association like the Associated Press, to refrain from publishing the name of a poison in connection with reports of suicides and it regards a violation of the rule as reprehensible journalism. It is unnecessary to repeat in detail the *Telegram's* reason for this, as it is perfectly obvious what effect such suggestion can have and daily does have on the minds of melancholic persons.

"In an earnest desire, however, to do what it can to offset the recent blunders of many newspapers in advertising a certain poison for suicide, or, in other words, promoting self-destruction, the rule will be here overstepped, but in a general way. A mistaken belief prevails that poisoning by bichlorid of mercury is an easy means of taking oneself off. The contrary, however, is the case as the poison is deadly, insidious, productive of great suffering, and so slow-working that the agonies of death are long drawn out. As a means of death bichlorid of mercury is the worst that can be used. Let THE JOURNAL of the American Medical Association affirm this in more authoritative words."

The rest of the editorial consists of a quotation from the editorial in THE JOURNAL.

SURGICAL INSTRUMENTS UNDER THE TARIFF BILL

In THE JOURNAL for May 3, 1913, p. 1382, the tariff rates on surgical instruments and the like under the present law were compared with the rates in H. R. 3321, as it was introduced into the House of Representatives. This analysis of the two measures showed a reduction from 45 per cent. ad valorem on surgical and dental instruments, or parts thereof, as are included in Paragraph 199 of the present law, to 25 per cent. ad valorem, as in Paragraph 169 of the Underwood bill. And this rate has been even further reduced by the finance committee of the Senate to 20 per cent. ad valorem. When Paragraph 130 was being discussed in the Senate, Senator Smoot moved to amend this at line 17, after the word "ad valorem," by inserting "surgical and dental instruments, or parts thereof, 40 per cent. ad valorem."

The amendment was proposed at the suggestion of the instrument manufacturers of this country, who, as Senator Smoot said, assert that even under the present 45 per cent. rate, fully 80 per cent. of such goods are imported from abroad, and that only about 20 per cent. are manufactured in this country. A reduction of 25 per cent., it was argued, would be extremely detrimental to our manufacturers. The proposed amendment was rejected. Senator Stone, however, promised to give the matter further consideration in the finance committee.

One View of "Friedmann Serum."—After having carefully studied all reports coming to hand through the medium of an extensive exchange list of first-class medical journals, our deliberate judgment is that the so-called "Friedmann serum" for the treatment of tuberculosis is either a fraud or half-baked scientific product, propagated solely for profit. It is destined not only to prove a source of exceedingly and inexcusably disastrous disappointment to the victims who have been attracted through their well-known credulity and the magnificent newspaper exploitation Friedmann has secured for his "cure," but a seriously dangerous remedy as well.

It is needless to say that the State Medical Association of Texas will not sanction the use of any secret remedy, particularly one deemed to be potentially dangerous and coming under such a cloud of disrepute as does the Friedmann serum. Our answer is that when the United States government issues a license to cover the manufacture of this serum, the State Health Department sanctions its use in the state and the Council on Pharmacy and Chemistry of the American Medical Association admits it to the New and Nonofficial Remedies, then, and not until then, will we sanction its use in this state. This is not an unreasonable stand to take because none of the requirements are impossible or difficult to meet. In view of the importance of the subject and the well-known ability and integrity of the physicians composing these bodies, it is strange that those who are exploiting this remedy, if they are honest in their belief in its efficacy, will not submit it for their approval.—*Texas State Jour. Med.*, September, 1913.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, October 7-8. Sec., Dr. John Wix Thomas, Phoenix.

COLORADO: State Capitol, Denver, October 7. Sec., Dr. David A. Strickler, 612 Empire Building.

DISTRICT OF COLUMBIA: Washington, October 14-16. Sec., Dr. George C. Ober, 125 B St., S. E.

GEORGIA: Regular, State Capitol, Atlanta, October 14. Sec., Dr. C. T. Nolan, Marietta; Homeopathic, Atlanta, October 1. Sec., Dr. R. E. Hinman, 106½ Whitehall St.; Eclectic, State Capitol, Atlanta, October 14. Sec., Dr. C. W. Miller, 102 W. North Ave.

IDAHO: Boise, October 7. Sec., Dr. John F. Schmershall, Jerome.

KANSAS: National Hotel, Topeka, October 14. Sec., Dr. H. A. Dykes, Lebanon.

LOUISIANA: New Orleans, October 27-29. Sec., Dr. A. B. Brown, 34 Cusachs Building.

MICHIGAN: Capitol Bldg., Lansing, October 14-16. Sec., Dr. B. D. Harison, 504 Washington Arcade, Detroit.

MINNESOTA: University of Minnesota, Minneapolis, October 7-10. Sec., Dr. Thomas S. McDavitt, 814 Lowry Building, St. Paul.

MISSISSIPPI: Jackson, October 28-29. Sec., Dr. E. H. Galloway, Jackson.

MONTANA: State Capitol, Helena, October 7. Sec., Dr. Wm. C. Riddell, Helena.

NEW JERSEY: State House, Trenton, October 21-22. Sec., Dr. H. G. Norton, 429 E. State Street.

NEW MEXICO: Santa Fe, October 13. Sec., Dr. W. E. Kaser, East Las Vegas.

OKLAHOMA: Muskogee, October 14. Sec., Dr. John W. Duke, Guthrie.

RHODE ISLAND: State House, Providence, October 2-3. Sec., Dr. Gardner T. Swarts.

UTAH: Salt Lake City, October 6-7. Sec., Dr. G. F. Harding, 310 Templeton Building.

WYOMING: State House, Cheyenne, October 15. Sec., Dr. J. B. Tyrrell, Laramie.

PSYCHOLOGY AND THE MEDICAL SCHOOL

SUMMARY OF THE REPORT OF THE COMMITTEE ON PSYCHOLOGY AND MEDICAL EDUCATION OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION *

Following the symposium on psychology and medical education[1] before the American Psychological Association in December, 1911, a committee was appointed to investigate and to cooperate with other bodies interested in this matter. The first part of the investigations of the committee forms the basis of the present report.[2]

The committee sent to all the known medical schools in the United States and Canada inquiries regarding the advisability of including psychology as a required subject for medical students. There were 102 American medical colleges from which answers might have been expected. Answers were received from 71, over two-thirds of the presumably active medical schools in this country. No answers were received from the eight Canadian medical colleges. In general the fullest answers were received from the Class A+ medical colleges, while on the other hand, with but few exceptions, the answers from the medical colleges in Classes B and C were most unsatisfactory as regards completeness.

The committee requested information along five lines. The special questions which were asked are given below. It will be noted that matters regarding which inquiries were made were not entirely or strictly psychologic. The inquiries were made broad because the general medical conception of psychology is not that of the professional psychologist or psychiatrist, as some of the answers plainly showed.

* Members of the committee: Shepherd Ivory Franz, scientific director and psychologist, Government Hospital for the Insane, and professor of physiology, George Washington University Medical School, chairman; E. E. Southard, professor of neuropathology, Harvard Medical School, and director of the psychopathic department of the Boston State Hospital, and J. B. Watson, professor of psychology and director of the psychologic laboratory, Johns Hopkins University. The full report will appear in *Science*, 1913.

1. Franz, Shepherd I.: The Present-Status of Psychology in Medical Education and Practice, THE JOURNAL A. M. A., March 30, 1912, p. 909.

2. At the present date two other associations have appointed committees with practically the same duties, that is, the American Psychopathological Association, at their meeting in May, 1913, and the American Medico-Psychological Association, at their meeting in June, 1913.

"1. What amounts of time and what proportions of the courses in anatomy (including histology), physiology and pathology are devoted to the nervous system?"

The individual answers to this question were on the whole unsatisfactory. Many of the colleges reported the numbers of hours without the percentages, others gave the percentages without the numbers of hours, and in only a comparatively few instances was the information complete. A tabulation of the answers, so far as this could be done, is given in Table 1.

TABLE 1.—ANSWERS RECEIVED FROM MEDICAL COLLEGES

	Hours	No. of Answers	Percentages	No. of Answers
Anatomy	123	26	17.5	17
Physiology	71	31	22.5	22
Pathology	30	22	12.3	18

From these averages the individual answers varied greatly. In anatomy there were reported 54, 55 and 60 hours by three schools, and 185, 192 and 246 hours by others. In physiology, two schools reported 18 and 20 hours, respectively, and two others 139 and 150, respectively. In pathology, the smallest amount of time was 5 hours, the greatest 60 hours. These variations may indicate differences in conception of different teachers of the relative importance of the nervous system, or, what appears to us likely in some cases, misunderstanding of the terms used. It is not reasonable to suppose that any school gives only fifty-four hours for dissection, demonstration and lectures on the nervous system, or eighteen hours to its physiology. In two widely used text-books of physiology the nervous system is given, respectively, 32 and 39.5 per cent. of the total space. It is probable that the term "nervous system" was, in a number of cases, used by our correspondents to denote only the central nervous system, and was not understood to include such obvious parts as the peripheral nerves and the organs of special sense. It is interesting and important, however, to note that, even with these probable underestimations, the total time assigned to the study of the nervous system averages about 10 per cent. of the total time of the first two years of the medical curriculum. If the question had specified "nervous system, including central and peripheral, and organs of special sense" it seems likely that most of the lower estimates would have been increased in anatomy and physiology so that nearly 15 per cent. of the time of the first two years would be shown to be devoted to the nervous system.

The committee believes that while it may be possible to teach anatomy, physiology and pathology without reference to psychologic matters, in practice this is rarely done. In considering the present status of psychology in the medical curriculum, account should therefore be taken of the inclusion in anatomy of a modicum of psychology, and in dealing with such matters as sensation and perception in the courses in physiology we must remember there is no strict separation of psychologic facts and theories from those of a physiologic nature.

"2. How far do the third (or fourth) year courses in nervous and mental diseases take up the biologic sides of neurology and psychiatry?"

From the answers received it is apparent that in a large proportion of our medical schools, neurology and psychiatry are taught as clinical subjects—diseases are described, differential diagnostic signs are discussed and methods of treatment are suggested. The broader aspects of these subjects are apparently not even hinted at in many schools, although a superficial reading of many of the answers might lead to the opposite conclusion.

"3. Are there elective or graduate courses in medicine which deal with the relations of neurology, psychiatry and psychology, and how much time is given to them?"

Only two schools out of sixty which answered this question replied in the affirmative. It is apparent that students and graduates in medicine who incline toward practice in diseases of the mind and nervous system have few or no opportunities in the medical schools of this country to acquire a broader acquaintance with the subjects of neurology and psychiatry than the clinical courses offer, but must turn to some other source. At times, courses have been given in connection with psychiatric institutes or hospitals for the insane to fit their own appointees for the work they may be expected to perform. With the exception of an apprenticeship in a hospital for the insane, and this is not always adequate, there is at present no possible means of getting an adequate conception of and training for dealing with the mass of nervous and mental disorders which is encountered in general practice. When it is realized that the proportion of insanity is greater than 1:300 of the general population, it is a matter for wonder that the medical schools do not offer adequate means for the acquirement of knowledge along these lines. It is not an exaggeration to say that the courses on insanity and neurology in medical schools are inadequate in time and usually quite unfit in character to prepare the student of medicine for this difficult part of his practice.

"4. Is there any correlation or cooperation between the department of psychology in the academic department and the department of neurology and psychiatry in the medical school?"

Three schools failed to answer this question; three others did not answer it because they were two-year schools, but their failure to answer for this reason indicated plainly that there was no cooperation or correlation between the medical work and the department of psychology in the college of arts and sciences. Eighteen other schools reported that they had no academic connections; thirty-three definitely reported no cooperation; one gave an unqualified affirmative answer and the remaining thirteen answered with more than a brief affirmation by giving indications of the character of the cooperation. Of the fifty-two schools which have affiliations, close or remote, with academic departments, only two-sevenths report any form of correlation or cooperation with the department of psychology, but a careful reading of the answers shows that not more than half of these have any definite form of cooperation or correlation. At the most the replies show that in some institutions academic students who are interested in psychology may attend certain courses in the medical school, and that in other institutions medical students are advised to take courses in psychology. It may be concluded that in this respect there is more promise than accomplishment.

"5. In view of the increasing realization of the importance of the mental factor in medicine, is it your opinion that (a) it would be advisable to have given to the students special instruction in psychology, and if so, (b) at what stage of the medical course would this course be best given?"

Only four of the seventy-one medical schools failed to answer the first part of this question. The numbers and percentages of the different replies are as follows: Fifty affirmative, or 75 per cent.; seven negative, or 10 per cent.; ten qualified affirmative and negative, 15 per cent. In addition it is worthy of note that eleven medical schools have already introduced (or plan to introduce next year) psychology into the curriculum or require it for entrance, and one school advises students to take a course in psychology in the preparatory premedical years.

Of the fifty schools which indicated their belief that psychology should be introduced into the medical curriculum, forty-seven have also indicated the position such work should occupy. Twenty-seven of these schools advise that it be placed in the premedical preparatory years or in the first two years of the medical course, and of this number twelve refer, explicitly or by implication, to the dependence of psychology on the facts of anatomy and physiology, and advise its introduction at a time when the courses in the anatomy and physiology of the nervous system are being given or after they have been completed. Although admitting its value, four schools would dismiss psychology by including it as a required course in the premedical years. The other eleven schools advise that a second course be given during the third or fourth years in addition to the requirement of the first years of the medical work. They would divide the instruction in psychology into two portions, the first to be offered to

students during the first part (including the premedical years) of the medical course, the second during the last two years of the curriculum. Another school receiving only college graduates, who usually have an academic course in psychology, also plans to have a course in psychopathology in the later years. Twenty schools stated that psychology should be given in the final years, most of these insisting that its place was a part of, or as a special preparation for, the work in nervous and mental diseases.

It may be urged that the views expressed are those of medical men especially interested in psychology, that is, psychiatrists and neurologists. All inquiries of the committee were directed to deans or secretaries of the schools, and only nineteen of the answers contained quotations or opinions from professors of neurology or psychiatry. The medical specialties of our correspondents, so far as they could be learned, ranged over the whole field of medicine. The decisively negative answers to our fifth question were received from five professors of nervous and mental diseases, one of anatomy and one administrative officer; the doubtful answers were received from two professors of nervous and mental diseases, two of anatomy, one each of physiology, medicine and pathology, and three administrative officers; the positive answers were received from thirteen professors of nervous and mental diseases, five of anatomy, three of physiology, three of pathology, ten of medicine, one of surgery, one of hygiene and fourteen administrative officers whose special medical interests are unknown. If all the answers from professors of nervous and mental diseases be omitted because of possible professional bias, the percentage of replies in favor of the introduction of psychology into the period of medical training is about the same as the general percentage.

From the facts which the committee has been able to gather the following conclusions have been drawn:

1. It appears to be the preponderating opinion that some instruction in psychology is necessary so that students may understand the mental side of their patients, not only of those who are insane but also of many who are never sent to institutions for nervous or mental diseases.

2. In those schools which require one or two years of college work part of the premedical preparation should be devoted to general psychology, or in lieu thereof, a course should be given, preferably in the second year, after the general work in anatomy and physiology of the nervous system has been completed. A briefer course following the physiology of the nervous system would be more desirable than a course in the premedical years. If the earlier course be more extensive and devotes sufficient time to the functions of the nervous system, the advantage of the later course would be counterbalanced.

3. It is the belief of most of the best schools that a second course in psychology should precede the course in clinical psychiatry and neurology. This course should be more practical and should deal especially with abnormal mental processes and with the application of psychologic principles and facts to medical topics. This course should deal chiefly with psychopathology, but it should not be permitted to develop, or degenerate, into a course in psychiatry, neurology or psychotherapeutics. Clinical material should be the basis of the course, but it should not assume the functions of the courses in psychiatry and neurology.

4. Both courses in psychology should be given by competent medical men, although there are at present few medical men who have had sufficient training or have sufficient interest in psychology to warrant their appointment to initiate such work. It seems best, therefore, to recommend that these courses be given jointly and cooperatively by the departments of psychology and psychiatry or neurology.

5. The content of the course or courses in psychology should be the object of careful consideration by representatives or professors of the departments of physiology, psychiatry, psychology and neurology. The first course in psychology, as introductory to the study of medicine, should be a general course, dealing largely with general psychologic facts, standpoints and methods, but constant reference should be made to the practical problems which may be solved by means of the psychologic methods and facts which are discussed. The advanced courses, however, should be practical and should deal with actual medical facts as much as possible. Both courses in psychology should be laboratory or experimental so far as possible, that the student may become personally acquainted with the methods and with the general nature of psychologic experimentation, rather than obtain his knowledge from text-books.

6. More extensive and intensive cooperation between psychologists and physicians is desirable. From the psychologist's standpoint the psychology of medical men is crude; from the medical standpoint the pathology and physiology of the psychologist are out of date. Since both classes have many common interests the knowledge of psychologists should be utilized by physicians, and in turn the experience of more physicians might be made available for the advancement of psychology and psychopathology.

Book Notices

STUDIES IN SMALL-POX AND VACCINATION. By William Hanna, M.A., M.D., D.P.H., Assistant Medical Officer of Health of the Port of Liverpool. Cloth. Price, $3 net. Pp. 52, with 25 illustrations. New York: William Wood & Co., 1913.

Dr. Hanna's book contains the results of his experience as health officer for the port of Liverpool. It consists of three parts: (1) a statistical study of 1,163 cases of small-pox, with special reference to the influence of vaccination in modifying the disease; (2) an analysis of 943 cases of small-pox (with primary vaccination) in relation to scar-area and severity of disease; (3) observations on the interaction of small-pox and vaccination. The study is an exhaustive one and the book is well illustrated with excellent photographs, well printed on good paper.

Hanna draws the conclusions from the first part that the small-pox mortality in the unvaccinated ranges from 25 to 40 per cent. and in the vaccinated is about 3 per cent.; that in the unvaccinated, those at the extremes of life, mainly children under 10 and old persons, suffer the most, the mortality of these two classes reaching as high as 50 per cent.; that in cases in which vaccination does not prevent small-pox, it modifies it to such a degree of mildness that it may be undetected. The conclusions from the second part are that the scar-area of vaccination has an important bearing on the severity of the disease, the larger the vaccination scar, the milder the attack of small-pox, if contracted. From the third part the conclusion is drawn that protection against small-pox is afforded by vaccination even if performed within three days after infection is contracted. The monograph is carefully and conservatively written, all of the statements being supported by facts and records.

PATHOLOGIC INEBRIETY. Its Causation and Treatment. By J. W. Astley Cooper, Medical Superintendent of Ghyllwood Sanatorium, with Introduction by Sir David Ferrier, M.D., F.R.S. Cloth. Price, $1.50 net. Pp. 151. New York: Paul B. Hoeber, 1913.

It is not to the credit of the medical profession that probably a large majority of its members look on the man suffering from an overdose of alcohol as a "drunk" of the more or less common variety. Whatever may be the cause of the intoxication, or whatever one's attitude toward the questions of personal temperance or general prohibition may be, the person who has taken, either in a long or a short period, an overdose of alcohol in any form is quite as much a subject for proper professional treatment as is the victim of morphin or strychnin poisoning. That the majority of physicians need information and instruction on the treatment of inebriety will be admitted by all who have given the subject serious consideration. Dr. Cooper endeavors to show that any efforts to cure inebriety by punishment are not only mistaken but also useless, and that proper medical treatment with adequate legal control is necessary in handling these cases. The natural forms and causes of pathologic inebriety are considered. The author recognizes three forms, dipsomania, periodic alcoholism

and chronic inebriety. Dipsomania he defines as a sudden periodic inebriety caused by an insane impulse to take stimulants to intoxication, irrespective of any immediately preceding alcoholic indulgence. The periodic alcoholic he distinguishes from the dipsomaniac in that as long as the periodic refrains from the use of alcohol he has no desire for it, while the dipsomaniac has the impulse whether he yields to it or not. The complications of inebriety are discussed under the heads of delirium tremens, epilepsy, albuminuria and insomnia. Treatment is considered under prevention, treatment by specific drugs, secret remedies and social remedies such as temperance societies, etc. To one familiar with the facts, the author in his reference to the "Keeley Cure" does not convey the impression of exhaustive investigation. In discussing drug treatment the author pays little attention to any other indication. Little emphasis is placed on the fact well known to every person who has seen any large number of alcoholics that the real drunkard, either periodic or chronic, always stops eating as soon as he begins drinking. The result is that the man who has been on a protracted debauch is not only suffering from alcoholic poisoning, but is also in an acute stage of malnutrition. The atropin and strychnin treatment and the system of treatment devised by Dr. Alexander Lambert of New York are discussed in detail. The book is not a particularly profound or exhaustive discussion of the subject but should be of value in attracting attention to a much-neglected field.

SAFEGUARDING THE SPECIAL SENSES. General Advice Regarding the Use and Preservation of the Eyes, Ears, Nose and Throat. By Henry O. Reik, M.D. Cloth. Price, $0.75 net. Pp. 123, with 4 illustrations. Philadelphia: F. A. Davis Company, 1912.

This is the result of fifteen years of experience in treating diseases of the eye, ear, nose and throat. Reik's experience has convinced him that the public needs more careful instruction as to the protection and preservation of the special senses. In the preface, he says, "The child is not expected to know that snoring generally means obstructed respiration, that recurring attacks of pain in the ear mean an abnormal growth in the nose or throat, or that inability to clearly see the school blackboard, or headaches following study are indications of bad eyes . . . The parents are but little wiser. Disinclination to study, a tendency to 'hook school" or failure to maintain a satisfactory class standard are much more frequently due to poor vision or eye-strain than to original sin." Parents are also negligent regarding their own sense organs. Reik's object is to present in a small volume, at a low price, information for the care of the eye, ear, nose and throat that will enable a reasonably intelligent person to keep these special sense organs healthy. The chapter on the eye includes a discussion of eye-strain, care of the eyes, reading-lights, foreign bodies, common afflictions and subjective sensations.

COMMERCIALIZING PROSTITUTION IN NEW YORK CITY. By George J. Kneeland, with a Supplementary Chapter by Katherine Bement Davis, Superintendent of the New York State Reformatory for Women. Introduction by John D. Rockefeller, Jr., Chairman of the Bureau of Social Hygiene. Cloth. Price, $1.30 net. Pp. 334. New York: The Century Company, 1913.

This report is the most elaborate and exhaustive of any yet issued. While covering much the same ground as the report of the Chicago Vice Commission, the experience of the investigator in preparing the first report is noticeable in the last one. The work in both cities was under the direction of Mr. George J. Kneeland. Three other volumes are planned for the present series, the object of the bureau being to collect, study and publish accurate and reliable information regarding the world-wide character of the traffic in vice. Two volumes will deal with the condition of social morals in the leading cities of Europe and with European police systems. The fourth volume will be based on studies made in different cities of the United States.

The material in the present volume is divided into two parts: first, the information secured and tabulated by Mr. Kneeland of actual conditions in New York City, and, second, a report on 647 women committed from New York City to the State Reformatory for Women. This part of the report is prepared by Katharine B. Davis, superintendent of the reformatory, and is largely based on information furnished by the women themselves. The report confirms the existence, not only in New York City, but also throughout the country, of an elaborately organized business for the exploitation of women by men. Probably the most interesting single fact is that brought out by Miss Davis on the mentality of inmates of the State Reformatory. Of 116 of these women, selected at random, and carefully examined by the Binet test, not one showed the mental development which would be normal for a child of over 12 years, twenty-nine had the mental development of 9-year-old children, forty-four of 10-year-olds and twenty-six of 11-year-old girls. From the entire study, Miss Davis concludes that approximately 30 per cent. of those studied are markedly mentally defective, and that this is an extremely conservative estimate. This fact indicates that prostitution is rather a question of mental development and normal mentality than it is of morals or moral impulses.

This report, with the reports from Chicago, Minneapolis and Cincinnati, form the most comprehensive collection of data on this subject available. The book will be read with deep attention by students of social conditions, and the publication of the three remaining volumes of the series will be awaited with interest.

HANDBOOK OF DISEASES OF THE EAR. For the Use of Students and Practitioners. By Richard Lake, F.R.C.S., Surgeon, Diseases of the Ear, London School of Clinical Medicine. Fourth Edition. Cloth. Price, $3 net. Pp. 287, with 81 illustrations. New York: William Wood & Co., 1912.

This little book contains descriptions of the anatomy and brief discussions of diseases of the ear, more particularly the surgical affections. It might be criticized in that it affords, perhaps, a too meager description of many difficult conditions and operations which the author attempts to present. A book on such an intricate organ as the ear and the hearing apparatus, if it is to be of value to the aural surgeon, should be more complete and extensive; but if intended only for the student and general practitioner, as this handbook purports to be, its brevity would make it amount really to a series of definitions of conditions in the hearing apparatus, many of which are difficult to handle even by the expert, and would not be of much assistance to the student or practitioner. The descriptions are well written, however, and the book is abundantly illustrated with splendid drawings and four colored plates.

A STUDY OF THE BACTERIA WHICH SURVIVE PASTEURIZATION. By S. Henry Ayres, Bacteriologist, and William T. Johnson, Jr., Scientific Assistant, Dairy Division. Paper. Pp. 66. U. S. Department of Agriculture, Bureau of Animal Industry, Bulletin 161.

This pamphlet contains the results of experiments in the Bureau of Animal Industry to determine the survival of bacteria after pasteurization by the methods usually employed, both the flash and the holding process. It contains interesting data as to the effectiveness of pasteurization of milk, and should be a valuable pamphlet for the information of health boards, and for distributers of milk who attempt to pasteurize their product.

UNIVERSITY CONTROL. By J. McKeen Cattell, Professor of Psychology in Columbia University. Cloth. Pp. 484. Price, $3.00 net. The Science Press, Garrison, N. Y.

A plea for academic freedom for the individual professor in the university and a protest against autocratic methods of control. A historical retrospect points out how early universities became famous and influential at times when they enjoyed this freedom and how influence waned when this freedom was lost. The greatness of the universities of Germany and elsewhere during the nineteenth century was when academic freedom and the independence and influence of the professor attained a remarkable supremacy. In comparison with the German universities the author states that "no efficient machine driven by the president of an American university can grind out such flour." A series of two hundred and ninety-nine unsigned letters from professors in various American uni-

versities are reproduced, and of this number, two hundred and fifty-three favor a greater faculty control of universities or a representative plan suggested in a previous article by the author, allowing of a greater democracy in university control.

THE PRACTICE OF UROLOGY. A Surgical Treatise on Genito-Urinary Diseases, Including Syphilis. By Charles H. Chetwood, M.D., LL.D., Professor of Genito-Urinary Surgery, New York Polyclinic. Cloth. Price, $5 net. Pp. 824, with illustrations. New York: William Wood & Co., 1913.

There is no dearth of books on genito-urinary surgery, and another addition to the list is not apt to excite the attention that it may deserve. The author's claim to distinction in the preparation of this book is in the fact that he has aligned the subject-matter as seemed to be most practical and desirable from both a surgical and a clinical aspect, beginning with diagnosis and general technic and following with the various abnormalities and diseases of the different anatomic regions, subdividing the operative surgery in like manner. The characteristic features embodied in this book which give it a modern status are the present local treatment of gonorrhea, the application of serum diagnosis and therapy, advancement in cystoscopic and functional renal diagnosis, and the latest on salvarsan therapy. The author is evidently considerably impressed with the value of the Phylacogens, in which many close clinical observers of wide experience differ from him. There is no reason why a method of treatment, young and unsupported by actual clinical results, should be given a place in a text-book. He is decidedly in favor of treatment by vaccines and serums. Urethroscopy and cystoscopy are well described—better than in most books on genito-urinary surgery. The illustrations supplement the text admirably.

THE PROS AND CONS OF VIVISECTION. By Dr. Charles Richet, Professor of Physiology in the Faculty of Medicine, Paris. With a Preface by W. D. Halliburton, M.D., LL.D., F.R.S., Professor of Physiology, King's College, London. Cloth. Price, $1. Pp. 136. New York: Charles Scribner's Sons, 1912.

Richet is at the head of the Department of Physiology in the Faculté de médecine de Paris. His discussion of vivisection might, therefore, be considered authoritative. In spite of the amount of existing literature on the subject, this little book will be read with much interest by those concerned in the preservation of freedom of research. It will also help the honest seeker after knowledge on this question to clear, accurate information and expert opinion. It is too much to hope that it will have any influence on the pronounced antivivisectionist, as the necessity for animal experimentation has been proved many times before without any effect on those whose minds are already made up. As the discoverer of serotherapy and a leader in physiologic research for a quarter of a century, Richet can speak with an authority not given to the ordinary scientist. An appendix gives the absolute and relative death-rate from diphtheria in Paris from 1872 to 1905, showing a decrease from eighty to fifteen deaths per hundred thousand after the discovery of antitoxin.

THE REPORT OF THE PHILADELPHIA BABY-SAVING SHOW. And the Proceedings of the Conference on Infant Hygiene. Paper. Price, $1. Pp. 270, with 61 illustrations. Philadelphia: The Child Hygiene Association, Real Estate Trust Building, 1913.

The educational value to a community of a scientifically arranged and conducted exhibit such as that of the baby-saving show held by the Child Hygiene Association of Philadelphia in 1912 is inestimable. The influence of that exhibit and the conference on infant hygiene held in connection with it extended far beyond the community in which it was held. Similar shows employing portions of the exhibit at Philadelphia were held in various cities through the state, showing the interest created by the Philadelphia show. This beautifully printed report gives in detail, with an abundance of illustrations, the various features of the baby-saving show, together with the papers and discussions at the accompanying conference. It constitutes a valuable record and a guide to other communities in preparing for similar educational exhibits, and its wide circulation would distinctly advance the cause of infant hygiene.

SURGERY OF THE EYE. A Handbook for Students and Practitioners. By Ervin Török, M.D., Surgeon to the New York Ophthalmic and Aural Institute, and Gerald H. Grout, M.D., Assistant Surgeon to the New York Ophthalmic and Aural Institute. Cloth. Price, $4.50 net. Pp. 507, with 612 illustrations. Philadelphia: Lea & Febiger, 1913.

This work well fulfils its mission of providing a small, compact students' hand-book. It is well illustrated with original plates and figures showing the important steps in a given operation.

PHOTOMICROGRAPHS OF SPIROCHETES, ENTAMEBAS, PLASMODIA TRYPANOSOMES, LEISHMANIA, NEGRI BODIES AND PARASITIC HELMINTHS. Paper. Pp. 45. War Department, Office of the Surgeon-General. Bulletin No. 1. Washington: Government Printing Office, 1913.

This is a highly interesting and valuable bulletin containing plates of various blood parasites together with a brief description and methods of staining and demonstrating them. An improvement that might be suggested would be the printing of the plates in colors.

GYNECOLOGIC OPERATIONS. Including Non-Operative Treatment and Minor Gynecology. By Henri Hartmann, Professor of the Faculty of Medicine, Paris. Authorized Translation Under the Author's Supervision by Douglas W. Sibbald, M.B., Ch.B. Cloth. Price, $7 net. Pp. 536, with 422 illustrations. Philadelphia: P. Blakiston's Son & Co., 1913.

Hartmann's views are so well known that it is unnecessary to comment on them. This English translation of his book will be welcomed by those who have accepted his teachings.

Medicolegal

Aid Which One Physician May Request of Another Without Incurring Liability Therefor—Requirements of Professional Courtesy

(*Gilday vs. Hennen* (*N. Y.*), *139 N. Y. Supp. 934*)

The First Appellate Term of the Supreme Court of New York reverses a judgment recovered by the plaintiff, and dismisses the complaint. The court says that the plaintiff and the defendant were both members of the staff of a hospital in the city of New York. While the defendant was performing an operation on a patient, he desired the plaintiff's aid, and sent a telephone message requesting the plaintiff to come to the hospital to help him out. The plaintiff immediately came to the hospital and went into the private operating room. A woman was on the operating table. Her abdomen was open and she was suffering from a hemorrhage. The defendant said to him: "Doctor, I wish you would finish this operation for me. This woman is bleeding. I can't control it." The plaintiff then finished the operation. The defendant was performing the operation for a fee of $10, and the patient was not strictly a charity patient, although the defendant was paying for the private room. The plaintiff thereafter brought this action to recover the reasonable value of his services.

Ordinarily, of course, when a person requests another to perform services for him, he impliedly agrees to pay the reasonable value of the services rendered at his request. This rule is founded in common sense. Unless the circumstances in which the request is made justify him in the belief that the person requested to perform the services would not expect any compensation, the person requesting the services must reasonably have supposed that his request implied a promise to pay for the services. Such circumstances exist where the relation of the parties is such that the services might well be requested as a matter of personal or professional courtesy or duty.

If, therefore, the plaintiff was entitled to recover on an implied contract to pay for the services rendered, it must be on the theory that there is no professional courtesy or duty requiring a physician to give aid to a brother practitioner associated with him in the same hospital, when the brother

practitioner's skill or experience is insufficient to cope successfully with an emergency that has arisen and which may cause disastrous results to a patient under his care. The court is absolutely unwilling to hold that the profession of medicine does not impose such an obligation on its members, nor does it believe that even the plaintiff would seriously contend that the judgment in his favor should be sustained, if it would be sustained only on such a theory.

He urged, however, that this obligation existed only in regard to charity patients in the hospital, and not in regard to private patients in a private room. The distinction which he tried to draw was, in the court's opinion, however, not logical. While a physician is entitled to reasonable compensation for his services from the person benefited, the services which he renders should not be measured by the compensation received. Physicians ordinarily recognize this rule and give the benefit of their skill free to persons who cannot pay for the services rendered, and as a matter of professional courtesy will give reasonable assistance to other physicians. The plaintiff showed that he recognized this rule by joining the staff of a hospital where it was the custom that physicians should treat patients gratis and aid each other in their treatment of public patients.

A physician who claims under an implied contract for his services should show, therefore, that the services were rendered, not as a part of his high professional obligations, or as a matter of professional courtesy, but because he expected to be paid for them. This is the test to be applied in every case where a physician sues on an implied contract. It seems to the court that, where a physician requests the services of another physician to aid him in earning compensation for himself, he is bound to pay for these services; but he has a right to believe that a fellow practitioner in the same hospital will expect no compensation, if his services are sought merely to aid him in an operation from which he himself expects to derive no substantial profit. If the operation had been performed in the public operating room, the plaintiff conceded that he would have been reasonably expected to render the requested aid without compensation; but the true distinction, it seems to the court, was not to be found in the place where the operation was performed, but was to be found in the nature and purpose of the services requested. Since the defendant requested the plaintiff's aid, not for the purpose of earning a fee for himself, but only for the purpose of alleviating suffering or removing an imminent danger, he had a right to expect that these services would be rendered freely and willingly.

Elements of Damage to Physician Compelled to Move from His Old Site

(In re Board of Water Supply (N. Y.), 142 N. Y. Supp. 83)

A special term of the Supreme Court of New York, Ulster County, says that this was a motion on the part of several persons having claims for damages for decrease in the values of their established businesses, because of the taking of lands for the Ashokan Reservoir, etc., to confirm the thirteenth Separate Report of Business Damage Commission No. 1. The city of New York made a counter motion to reject the report. One of the claims was that of a physician. The commissioners took the ground that, as his wife did not choose to charge him anything for the rent of his office and barn, there was no reason why any deduction should be made on such an item in the interest of the city. But the court thinks that, in determining his net earnings, the rental value of such office as he used for his business, in the house, and of the barn should be deducted. The fact, however, that he earned, after the taking of the property where his office was located, nearly or quite as much as he earned before, though proved, did not throw much light on his damage. In place of the patrons evicted by the taking of the land men had come to construct the reservoir and the physician's practice had thus been fictitiously sustained, for when the work was completed his old patrons and his new ones would both have gone. Thus the decrease in the value of his business might become correctly apparent. The rule stated by the Supreme Judicial Court of Massachusetts is: "In estimating the . . . value of the business of a . . . physician, . . . the damages are to be assessed for the actual decrease in value of that business, and not merely for the decrease in such elements of the value as admit of being sold. The decrease in the money value of the petitioner's business to himself is to be estimated." *Earle vs. Commonwealth*, 180 Mass. 579. In finding the injury done to the business of a physician regard should be had for another principle of law. It has been held proper where one whose occupation or business has been interrupted or injured by an act of a stranger, and thereby damaged, to prove any circumstances in abatement of such damages which will tend to mitigate or lessen them. There are so many elements entering into the ascertainment of damage to a physician because of being compelled to move from his old site that it is particularly within the province of a jury to determine them in the light of all the facts and circumstances. The award on this claim is set aside and vacated because of the error herein pointed out.

Liability of Railroad Company for Obstructing Highway and Delaying Physician in Reaching Patient

(Terry vs. New Orleans Great Northern Railroad Co. (Miss.), 60 So. R. 729)

The Supreme Court of Mississippi reverses a judgment rendered for the defendant after the jury had been peremptorily charged to find for it on the ground, apparently, that its negligence in unlawfully obstructing the highway was not the proximate cause of the plaintiff's pain and suffering being increased and prolonged, and of the laceration to her body incident to the method pursued by the physician in delivering her of a child. That, the court holds, was error. The plaintiff, as a member of the general public, had the right to have the highway remain unobstructed so that it could be used by her for any legitimate purpose, and having a physician to travel over it to reach her bedside in order to relieve her pain and suffering was, of course, such a purpose. The defendant, under section 4049 of the Code, owed her the duty of refraining from obstructing the highway for a longer period than five minutes, and it was liable to her for any damage which resulted to her by reason of its having obstructed the highway. While it was hardly probable that its servants could have anticipated that the plaintiff would be in need of the services of a physician at the time they blocked this crossing, and that such physician in his journey to her bedside would arrive at that particular point at that particular time, they could, and ought to, have anticipated that some person traveling along the highway might be detained by reason of its being blocked, and that injury would result therefrom, either to the traveler himself or to some other person. This was sufficient to constitute the negligent blocking of the crossing the proximate cause of any injury which the plaintiff sustained by reason of her physician being detained thereby. Her physician was on his way to the bedside of the plaintiff, who was suffering intense pain and anguish incident to the abnormal presentation of a child to which she was then about to give birth. The highway necessary to be traveled by him in reaching the plaintiff's home crossed the track of the defendant's railroad. When he reached the crossing, he found it blocked by an unusually long freight train. There was, according to his testimony, no opening in this train at any point, and it continued to obstruct the highway for a period of between thirty and forty minutes. According to other testimony, the crossing was blocked for a period of about forty-five minutes. When the physician reached the plaintiff's bedside he found her so much exhausted that he was compelled to relieve her quickly of the child, which he did in about ten minutes after his arrival, some laceration of her body resulting therefrom. The court thinks it clear from the evidence that the plaintiff's suffering was prolonged by the delay of the physician in reaching her bedside, but whether she sustained any additional injury thereby was a question of fact for the jury.

Society Proceedings

COMING MEETINGS

Am. Academy of Ophthal. and Oto-Laryn., Chattanooga, Oct. 27-29.
American Association of Railway Surgeons, Chicago, Oct. 15-17.
American Roentgen Ray Society, Boston, Oct. 1-4.
Clinical Congress of Surgeons of N. A., Chicago, Nov. 10-15.
Colorado State Medical Society, Glenwood Springs, Oct. 7-9.
Delaware State Medical Society, Dover, Oct. 13-14.
Idaho State Medical Association, Pocatello, Oct. 9-10.
Medical Association of the Southwest, Kansas City, Mo., Oct. 7-8.
Minnesota State Medical Association, Minneapolis, Oct. 2-3.
Mississippi Valley Medical Association, New Orleans, Oct. 23-25.
Nevada State Medical Association, Reno, Oct. 14-16.
New Mexico Medical Society, Albuquerque, Oct. 2-4.
Vermont State Medical Society, Burlington, Oct. 8-10.
Virginia Medical Society, Lynchburg, Oct. 21-24.
Wisconsin State Medical Society, Milwaukee, Oct. 1-3.

RHODE ISLAND STATE MEDICAL SOCIETY

Meeting held at Providence, Sept. 4, 1913

Clinical Report on Friedmann's Vaccine

DR. HARRY L. BARNES, superintendent of the State Sanatorium for Tuberculosis at Wallum Lake, read a paper reporting 120 cases of tuberculosis treated with the Friedmann vaccine, an abstract of which follows:

In view of the fact that reports of animal experiments were meager and inconclusive, case reports of those injected with the vaccine were too scanty and the time elapsed after such injections too short to be sure of its safety or value, patients were told of this uncertainty and that the vaccine would be given them only on their own responsibility. Because of the widespread newspaper comments on this subject, with very few exceptions the patients were all exceedingly eager to take the remedy.

Dr. Friedmann injected 69 patients on April 9. On May 28, 43 were given the second injection by him and on June 8, 40 additional patients were given the first injection by Dr. Dwinell, who has charge of the Friedmann Institute in Providence. Eleven other patients were given injections shortly before admission, giving a total of 120 cases.

Sixty per cent. of the patients reported on had been observed five months after receiving the vaccine. Fifty-three per cent. had received two injections, 15 per cent. three injections, and about 6 per cent. four injections. Friedmann has stated that an infiltrate must form at the place of injection and that this will gradually disappear in the course of the next few weeks or months. As long as this tissue exists and during its gradual absorption healing will go on. From this statement it would appear that it is the induration and absorption therefrom and not the number of injections on which the improvement depends. In his paper Friedmann claimed that improvement in pulmonary cases began almost immediately after the first injection. Friedmann himself asserted that many of the patients here reported on had improved as the result of the vaccine when he saw them fifty days after the first injection. Concerning these statements, Dr. Barnes said: "We are then to-day in just as good position to judge whether these patients have made a remarkable temporary improvement as we ever shall be. Only two bed-patients were treated on Dr. Friedmann's visits because we had directed them to come last and there was not time to treat all. He selected several cases, however, after he had been informed that cavity signs were present. He examined only one case, in every instance relying on the sanatorium charts."

Smears were taken from abscesses at the site of injection, and examination of the bacilli showed them to have no acid-fast properties during the first twenty-four hours. Cultures taken from the vaccine appeared identical with those taken from the abscesses. Blood examination made from nine patients thirty-four days after injection of the vaccine were negative for tubercle bacilli. Examinations of the urine five days after the vaccine was administered were also negative for tubercle bacilli.

Two guinea-pigs and two turtles injected with the vaccine showed no signs of tuberculosis after several months.

Temperature reactions followed injections of vaccine in thirty, or 25 per cent. of all cases. As a whole these reactions were very similar to tuberculin reactions. Test examinations made during or shortly after the fever showed no focal reactions, so often found during tuberculin reactions, and as a rule the sputum was not increased during the week following the first injection.

Of 117 cases, 55 had a slight increase in the amount of sputum, 45 had a slight decrease and the remaining 17 cases had the same amounts. The average duration of the fever reaction was 2.6 days.

Usually at the end of a week a small hard nodule about the size of a pea and tender on pressure could be felt at the site of injection. Thirty per cent. of the cases failed to develop induration after the first injection. In 25 per cent. indurations resulted in abscesses and in 44 per cent. there were "satisfactory" indurations after the first few days. Indurations usually obtained their greatest size during the second week, except in those cases which developed abscesses. In the twenty-eight cases in which there were abscesses, 6 were slight, 14 moderate and 8 severe. Only four abscesses were reported among 83 men, while 24 of the 47 women developed abscesses. Most of the abscesses ruptured spontaneously between the third and sixth week after the injection.

There was no increase of leukocytes on the day following the inoculation and no marked leukocytosis during the reaction.

Dr. Barnes described minutely cases of various types. Of the 120 cases, tubercle bacilli had at some time been found in 99, or 82 per cent. Of the remaining 21 cases, there had been both hemoptysis and pleurisy in 7 cases, hemoptysis alone in 5 cases, pleurisy alone in 3 cases and the subcutaneous tuberculin tests in addition to physical signs in 4 cases. Most of these patients were second-stage patients. Only 5 were far advanced and only 1 was near death when the vaccine was given. Of 113 patients, 110 had received sanatorium treatment for periods varying from a few days to twenty-four months, during which they had gained from one to fifty-seven pounds. Had all the patients been discharged from the institution on the day the first treatment was given, their condition would have been classified as follows: arrested, 12; apparently arrested, 3; quiescent, 20; improved, 53, and unimproved, 32.

Friedmann has asserted that soon after the first administration of the vaccine there occurs a striking subjective improvement in practically all of the symptoms of the disease. The majority of the patients continued to cough much the same as such patients usually do cough in sanatoriums. Many improved in this respect and some did not. No unusual improvement was noted, but some patients coughed much worse after the administration of the vaccine.

Of 74 patients whose twenty-four-hour amount of sputum was measured the sputum was decreased in quantity in 56 per cent., showed no change in 12 per cent. and increased in 31 per cent. Of 74 control patients the amount of sputum was reduced in 51 per cent., remained the same in 11 per cent. and was increased in 37 per cent. This comparison is slightly in favor of those taking the vaccine. Fifteen per cent. of the 47 patients whose sputum had been positive before inoculation showed no tubercle bacilli four months after the first injection.

Barnes believes that, taken as a whole, the patients' appetites remained about the same except in those who had temperature reactions, in several of whom the appetite was worse.

Forty-two per cent. gained weight in amounts ranging from ¼ pound to 28½ pounds. Fifty-seven per cent. lost weight in amounts ranging from ¼ pound to 15½ pounds. Only about 18 per cent. of the patients under ordinary sanatorium treatment lose weight. In his judgment, hypnotics have been used fully as frequently in the vaccine treated as in other cases.

As Friedmann laid much stress on the relief of chest pain and discomfort, 70 patients were questioned in regard to this symptom between two and four months after the first injec-

tion. Of these, 28 had no pain before or after, 23 had the same amount, 14 less and 5 had more.

"From this," said Barnes, "we certainly cannot subscribe to Friedmann's statement that soon after the injection of his vaccine the patients lose all their troubles."

The analysis of temperature charts shows not only that the vaccine does not control but also that it induces fever. Friedmann claims that hemoptysis is never observed in consequence of or following the injection. An analysis of the records shows that the incidence of hemoptysis was slightly greater among those who took the vaccine than among those treated by ordinary methods.

In 115 cases physical signs before the first treatment were compared with the physical signs at the last recorded examination. The signs were rated as being about the same in 57 cases, as more in 35 cases and less in 23 cases. Taken as a whole, there certainly was no unusual tendency toward disappearance of signs.

On September 1, when the statistics of the present results were compiled, the average time which had elapsed since the first injection was 120 days, or about a month less than the average sanatorium residence of patients. The present condition of only 85 patients is known, and as compared with their condition at the time of the first injection of vaccine, 17 are better, 34 the same and 34 worse. From this it appears that 40 per cent. of the patients in this series are not in as good condition as when they received their first injection. The proportion of patients discharged from the sanatorium as unimproved under ordinary forms of treatment has never exceeded 23 per cent.

The unfavorable result in many cases appears to be due to the increased activity of the pulmonary lesions as a part of and following reaction to the vaccine. In several cases the signs of increased activity have subsided or are subsiding, while in others, even after five months, there is, as yet, no signs of decreased activity. Dr. Barnes then offers the following conclusions:

"This report offers no evidence as to whether or not the vaccine can prevent tuberculosis in those who are free from it, as no healthy persons were inoculated.

"It offers no evidence as to the liability of the vaccine to induce local or general tuberculosis, as this can be determined only by necropsy or special bacteriologic work.

"One patient with joint tuberculosis showed striking improvement, which makes it desirable that similar patients who have received this vaccine should be observed and reported on by those who have had orthopedic experience. The four other patients having active tuberculosis outside the lungs have not shown unusual improvement.

"The 120 patients having pulmonary tuberculosis have shown none of the immediate and wonderful results reported by Friedmann and others before the Berlin Medical Society. On the contrary, about 17 per cent. of the cases have shown an increased activity of the disease, which would not have been expected under ordinary sanatorium treatment."

Following the reading of Dr. Barnes' report the meeting was thrown open for discussion.

DR. DWINELL, who is at the head of the Friedmann Institute in Rhode Island, criticized Dr. Barnes for reporting cases which had received only one or two injections. He stated that the report dealt too much in statistics compiled from the records of the institution and too little with subjective symptoms as obtained from the patients. He cited some of the cases reported on, which he claimed had shown wonderful improvement. He concluded by saying that the statistics were inaccurate and the report of questionable value. Dr. T. J. Smith said that he had talked with and examined these patients at the sanatorium. They had told him they felt better. He could not understand Dr. Barnes' report or why it was made at this time.

MR. W. L. HARRIS said that he had not observed the pulmonary cases, but that some of the joint cases had improved, and he thought that these cases should be observed by more physicians than were doing so at present. Dr. J. T. Farrell, who had radiographed some of the joint cases, said that they showed improvement.

DR. JAY PERKINS said that patients who had come under his observation had not shown the marked improvement they should have shown in view of statements made concerning the Friedmann vaccine. He had seen one patient who developed fever after the second injection and has continued to fail since. He believed that Dr. Barnes' statistics were accurate.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

September, VI, No. 3, pp. 151-224

1 Dyspituitarism. M. S. Reuben, New York.
2 *Wassermann Reaction in One Hundred Infants. K. D. Blackfan and S. T. Nicholson, Baltimore, and T. W. White, St. Louis.
3 *Wassermann Reaction in Hereditary Syphilis, in Congenital Deformities and in Various Other Conditions in Infancy. L. E. Holt, New York.
4 *Luetin Reaction in Infancy. A. Brown, New York.
5 *Results with Salvarsan in Hereditary Syphilis. L. E. Holt and A. Brown, New York.
6 *Results of Treatment with Salvarsan in Late Congenital Syphilis. G. S. Strathy and G. A. Campbell, Toronto.
7 Rapid Clinical Method for Estimation of Total Fat in Infants' Stools. D. M. Cowie and W. S. Hubbard, Ann Arbor.

2. **Wassermann Reaction in 100 Infants.**—In this investigation the serums from 101 infants, irrespective of the reason for which they were in the hospital, were tested. The technic employed was that advocated by Wassermann, and in forty-three instances this was supplemented by tests made according to the method of Noguchi. The blood was procured by means of the suction apparatus described by Blackfan. In Group I there were 68 children, none of whom gave, on investigation of their family or past history or by physical examination, any evidence of hereditary syphilis. The Wassermann reaction was negative in 66, doubtful in 1 and positive in 1. The Noguchi modification was made in 43 of the cases in this group, and verified the results of the Wassermann test; i. e., 41 serums were negative, 1 was doubtful and 1 was positive. In Group II no clinical evidences of hereditary syphilis were found in 30 infants. In 2 infants the family history was suggestive. In 1 infant, the family and past history and the physical examination were suggestive of syphilis. The Wassermann reaction was negative in 32 of the infants and positive in 1 infant.

3. **Wassermann Reaction in Hereditary Syphilis, Etc.**—Holt claims that cases of hereditary syphilis almost invariably respond positively to the Wassermann test, even when previously treated by mercury, unless the treatment has been very thorough and protracted. After the use of salvarsan it has been his experience that it disappears much more regularly and earlier, but even then in most cases only after repeated injections. Of 178 tests made in hospital patients showing no definite signs of syphilis, positive reactions were obtained in but eleven and five of these were shown on fuller investigation or subsequent findings to be pretty clearly syphilitic. Two of the remaining six were doubtfully so. The great portion of congenital deformities Holt believes have no relation to syphilis, since not a single positive reaction was obtained in fifty-six consecutive cases.

Of sixty-two patients suffering from malnutrition or marasmus, only five gave a positive reaction, and are included in the group above mentioned. Of the remaining fifty-seven, nearly one-third had very considerable enlargement of the spleen or liver, or both. Since the cases examined were selected from a much larger number, as those most likely to be syphilitic, Holt cannot regard syphilis as a common cause of marasmus, certainly in the patients admitted to the Babies' Hospital. Since the error, when one exists, is almost invariably on the positive

side, the technic of those who find a very large proportion of positive reactions among maramus patients in institutions is open to suspicion, he claims.

4. **Luetin Reaction in Infancy.**—In all Brown made 134 tests. Thirty-four were in patients with hereditary syphilis, and 100 in controls. Of the syphilitic infants all but four gave a positive luetin reaction. In the 100 controls, ninety-six were definitely negative and four gave a doubtful reaction. All of the negative cases were also negative to the Wassermann test. In all the cases regarded as syphilitic the diagnosis was confirmed by the Wassermann reaction and the clinical history. Of the syphilitic patients with a negative luetin reaction, all four were cases of severe infections and either the hemoglobin was very low or the skin much thickened so that one could not be certain of a positive reaction. Of the thirty positive luetin cases, fifteen showed small pustules; the other fifteen reacted in the form of a definite inflammatory papule. In addition it was observed that the more energetic the treatment the more distinct was the reaction. Especially was this the case after salvarsan injections. There were fourteen infants in whom the test was repeated after injections of salvarsan; of these, eight became negative during an average period of five months after the first injection of salvarsan. In each instance the Wassermann reaction corresponded with the luetin test, i. e., it became negative at or about the same time. In the remaining six positive cases the reaction was present at the time of the last test made, which averaged three and a half months after the first injection of salvarsan. In this group also the Wassermann corresponded with the luetin test.

5. **Salvarsan in Hereditary Syphilis.**—Holt and Brown summarize their paper as follows:

1. Immediate and striking benefit follows the injection of salvarsan in hereditary syphilis, and this is seen in many patients in whom mercury has been used with little or no apparent benefit. 2. Salvarsan must be given intravenously; with the technic which we have described its administration is not difficult and it is practically free from danger. 3. A single dose of salvarsan does not cure hereditary syphilis, although it often removes the visible symptoms. Relapses, however, are to be expected unless the dose is repeated. With present experience it seems advisable to repeat the injections at intervals for one year, even though no symptoms are present. 4. The best results in hereditary syphilis are undoubtedly obtained by the early use of salvarsan followed by mercurial treatment. 5. Even with the aid of the Wassermann reaction it is difficult to say when a child with hereditary syphilis is actually cured.

6. **Salvarsan in Congenital Syphilis.**—The authors' eighteen patients improved clinically under salvarsan treatment. The intensity of the Wassermann reaction diminished steadily with frequently repeated full doses, but in nine patients over 4 years, who received four doses or more, only two became negative, and that after eight and nine doses. They found that the younger the child, the more quickly does the Wassermann reaction become negative. They have not found the administration of salvarsan by intravenous injection in children to produce any bad effects.

American Journal of Medical Sciences, Philadelphia

September, CXLVI, No. 3, pp. 313-468

8 Lobar Form of Bronchopneumonia of Long Duration, Occurring in Children and Young Adults. D. Riesman, Philadelphia.
9 True Value of Operation for Cancer. E. M. Foote, New York.
10 *Therapeutic Artificial Pneumothorax. H. M. King and C. W. Mills, New York.
11 *Diagnosis of Tuberculosis of Kidney. F. E. Keene and J. L. Laird, Philadelphia.
12 Invagination of Meckel's Diverticulum Associated with Intussusception: Report of Case, with Study of Recorded Cases. A. E. Hertzler and E. T. Gibson, Kansas City, Mo.
13 Spinal Gliosis Occurring in Three Members of Same Family, Suggesting Familial Type. G. E. Price, Philadelphia.
14 Technic of Abderhalden's Pregnancy Reaction. C. C. W. Judd, Baltimore.
15 Seven Cases of Cervical Rib, One Simulating Aneurysm. N. G. Seymour, New York.
16 *Polyneuritic Form of Acute Poliomyelitis: Clinical and Pathologic Study. S. Leopold, Philadelphia.
17 Intensive Study of Insects as Possible Etiologic Factor in Pellagra. A. J. Jennings and W. V. King, Washington, D. C.

10. **Therapeutic Artificial Pneumothorax.**—In sixteen cases in which the treatment has been tried by King and Mills two have shown marked and apparently permanent improvement, six have shown temporary or slight improvement, in one case hemorrhages have apparently been controlled, in one case of lung abscess no improvement followed, while in six cases, on account of pleural adhesions, either no gas could be injected or not enough to produce any sufficient collapse.

11. **Tuberculosis of Kidney.**—Fifty-eight cases of suspected renal tuberculosis were examined by Keene and Laird by the combined clinical, Bloch and subcutaneous laboratory methods. Twenty-two cases were proven, seven by operation and fifteen by subsequent clinical course, to have tuberculosis of the genito-urinary tract; twenty-nine were proven, three by operation and twenty-six by subsequent clinical course, to be non-tuberculous; seven cases were still clinically doubtful. By the Bloch method of inoculation, seventeen cases were positive, forty negative, and one doubtful, due to the same cause. In the clinically proven cases of tuberculosis, therefore, 77.3 per cent. were positive by both laboratory methods. The seven clinically doubtful cases gave negative results by both methods.

Of the clinically proven negative cases all but one gave negative results, and this was positive by both the Bloch and subcutaneous methods. This case was brought to operation on account of the positive laboratory findings; the apparently affected kidney was exposed and split, and showed, macroscopically, an interstitial nephritis and no evidence of tuberculous involvement. Two of the proven positive cases which gave negative laboratory results were closed cases, the ureter of the affected side being obstructed; one had advanced bilateral renal involvement, which shortly caused death; the other two were frank cases of unilateral renal tuberculosis. There were two clinically positive cases, each giving negative results by each of the two laboratory methods and positive by the other. Another positive case showed numerous tubercle bacilli in the inguinal glands of the pig at the expiration of ten days, and only one small focus of infection in the spleen of the other pig at the end of six weeks.

The authors conclude that the kidney is the primary site of disease in tuberculosis of the female urinary tract; as a rule the infection originates from a focus in some other organ and gains entrance to the kidney by way of the blood-stream. The pathology varies greatly in kind as well as in degree, but a definite type usually predominates, altering both the pathologic and clinical pictures. Subjective symptoms referable to the kidney disease are by no means characteristic; they are often entirely lacking, may be expressed by a dull, aching sensation in the lumbar region or by attacks of colic resembling calculus. The most prominent symptoms are those referable to deranged bladder function; starting with painless polyuria, all degrees of dysuria are met, including the most intense strangury and even incontinence. These symptoms may be decidedly intermittent in their severity, with intervals of comparative comfort. A cystitis which does not readily yield to the usual appropriate measures should arouse the suspicion of renal tuberculosis. Some degree of pyuria is the rule; hematuria the exception. Intermittent pyuria suggests tuberculosis of the kidney. Pyuria without demonstrable bacteria by smear or culture in a catheterized specimen is likewise suggestive. Albuminuria is usually present, but small in amount compared to the degree of renal involvement.

In the absence of mixed infection the temperature is normal or shows only a slight evening elevation; irregular fever, with chills and sweats is evidence of a mixed infection or a more generally disseminated tuberculous process. The palpatory findings are dependent on the type and extent of the pathologic changes. While enlargement of the diseased kidney is usually manifest, it is important to remember that compensatory hypertrophy of the kidney may be given erroneous conclusions in determining the diseased organ. Thickening of the vaginal portion of the ureter is of value in diagnosis but by no means characteristic of tuberculous infection. The tuberculin reaction is of doubtful value; the subcutaneous injection should be employed and its results are significant only in the presence of increased kidney or bladder symptoms. By far the most important agent in determining the diagnosis is the cystoscope, which in the majority of cases shows a

picture so characteristic that the nature of the infection is at once recognized. Only by its use can we decide the extent of disease as well as the condition of the opposite kidney as regards both its anatomic and functional integrity.

The diagnosis of renal tuberculosis should be made in every suspected case by the combined clinical and laboratory examination. The Bloch method of inoculation of guinea-pigs should be used, because it is equal in reliability to the older method, and the diagnosis may be made in at least 77.3 per cent. of cases in ten days compared to six weeks by the subcutaneous or intraperitoneal methods, which should also be used as controls. A positive laboratory result by either method determines the diagnosis of tuberculosis of the genitourinary tract; of renal tuberculosis in the female, the exact focus in the male to be determined by additional clinical and laboratory means. A single negative laboratory result, regardless of thoroughness of examination, does not determine an absolute negative diagnosis of renal tuberculosis, as the manifestations of this disease are essentially intermittent. Negative results obtained in three successive weekly examinations should, however, bear considerable weight in the diagnosis.

16. **Polyneuritic Form of Acute Poliomyelitis.**—Leopold cites the case of a young female who, without any previous illness, was suddenly seized with vomiting, fever, pain in the head and back, followed in several days by pain and paralysis in the lower limbs, together with paralysis of the bladder. The important physical symptoms were loss of patellar tendon reflexes and unsymmetric paralysis of both lower limbs, with partial areas of hypesthesia. There was bladder paralysis. In addition there was marked tenderness on pressure over the nerve trunks in the paralyzed extremities, which persisted until death, two months after the onset. At necropsy the heart, lungs, spleen and liver showed no changes. The kidneys showed cloudy swelling. A few punctate hemorrhages were seen in the visceral pericardium. No exudate was noted in the meninges of the brain or spinal cord. The vessels were injected. The cord in the lumbar region was somewhat softer than in the other portions, and on section showed a reddish-gray area in both anterior horns.

Microscopic sections were made from various levels of the spinal cord and medulla oblongata. These sections were stained with thionin hemalum and acid-fuchsin, by Weigert's stain, and by the Marchi stain. Only one peripheral nerve and portion of one muscle were obtained and these were from the anterior aspect of the right thigh, near Poupart's ligament. A portion of the nerve was placed immediately in osmic acid and teazed after twenty-four hours. Another portion was placed in Muller's fluid and studied by the Weigert, hemalum and acid-fuchsin stains. There was no evidence of an acute or subacute inflammatory process, and no distinct degenerative changes were noted. The hemalum-acid-fuchsin stain showed slight increase in the connective tissue. There was no round-celled infiltration. The osmic acid showed slight swelling of the fibers, some granulation of the myelin, but no breaking up into droplets. Most of the fibers were normal with Weigert's stain. The section of muscle showed no round-celled infiltration, no swelling or atrophy of fibers. The striations could be seen, but were not sharply defined. In the medulla oblongata no changes were noted. The cervical and thoracic areas of the spinal cord showed no changes. In the lumbar area stained with the hemalum-acid-fuchsin the meninges showed an intense round-celled infiltration. The pial vessels were dilated and intensely engorged with blood. Around and within the anterior and posterior roots the round-celled infiltration was intense, and the capillaries were intensely dilated. The anterior horns showed the characteristic picture of the subacute stage of an acute poliomyelitis. The left anterior horn was more involved than the right. The capillaries were injected, the round-celled infiltration was marked, and the cells showing a clear protoplasmic area around the nucleus. Many lymphoid cells, a few connective-tissue and polymorphonuclear cells were also seen. The ganglion cells had practically disappeared as only a few were seen, and those remaining were atrophied. With the Nissl stain the disappearance of the ganglion cells and the varying grades of degeneration of those remaining were most marked. No changes were seen in the posterior horns or in the white matter. The Weigert stain showed no sclerosis. These changes were noted in the second, third, fourth and fifth lumbar segments. The changes found in the lumbar region of the spinal cord were those of an acute poliomyelitis in the reparative stage. The anterior horns were practically destroyed. Intense inflammation was noted in the meninges and around the posterior roots. Most interesting was the exudate and inflammation of the spinal roots. The peripheral nerve showed no evidence of a primary neuritis.

American Journal of Public Health, New York

August, III, No. 8, pp. 729-845

18 Year's Work against Typhoid in Yakima Valley and Results Achieved. T. Tetreau, North Yakima, Wash.
19 Rural Typhoid in Manitoba. R. M. Simpson, Winnipeg, Can.
20 Plea for More Wide-Spread Interest in Investigation and Control of Typhoid. W. C. Hanson, Boston, and L. A. Jones, North Adams, Mass.
21 Some Relations between Filtered Water and Typhoid as Shown in Two Years' Service of Wilmington Filters. T. C. Hatton, Washington, D. C.
22 Municipal Control of Typhoid. C. R. Grandy and C. J. Andrews, Norfolk, Va.
23 Institutional Vaccination against Typhoid. J. N. Force, San Francisco.
24 Solubility of White Lead in Human Gastric Juice and Its Bearing on Hygiene of Lead Industries. A. J. Carlson and A. Wielfel, Chicago.

Annals of Surgery, Philadelphia

September, LVIII, No. 3, pp. 289-432

25 Esophagoplasty. W. Meyer, New York.
26 Some Surgical Features of Injuries of Spine, with Special Reference to Spinal Fracture. C. A. Elsberg, New York.
27 *Practicability of Reducing Caliber of Thoracic Aorta by Plication or Infolding of Its Walls. R. Matas and C. W. Allen, New Orleans.
28 Some Anatomic and Physiologic Principles Concerning Pyloric Ulcer. G. P. Larosqe, Richmond, Va.
29 *Relationship between Gastric and Pancreatic Carcinoma. E. A. Schumann, Philadelphia.
30 Subdiaphragmatic Abscess. D. L. Despard, Philadelphia.
31 *Experimental Anatomic and Physiologic Observations Bearing on Total Extirpation of Colon. A. Schachner, Louisville, Ky.
32 Diverticulitis of Sigmoid. J. Douglas, New York.
33 Hernial Sac in Its Relation to Concealed Intestinal Injuries. C. M. Remsen, Atlanta, Ga.
34 Development of Malignant Disease of Cervical Stump after Supravaginal Hysterectomy. V. N. Leonard, Baltimore.
35 Sacrococcygeal Tumors. R. Ollerenshaw, Manchester, England.
36 *Purpura of Bladder. F. Kidd, London.

27. **Plication of Thoracic Aorta.**—In the light of present knowledge Matas and Allen hold that the direct intervention of surgery in the treatment of aortic aneurysm must be restricted to explorations, both abdominal and thoracic, which will permit us to ascertain the relations of the aneurysmal sac to the parent vessel. In a certain number of cases of saccular aneurysm, it may be possible to obliterate the communications leading from the sac to the artery by the method of intrasaccular suture. In the majority of cases the operation will have to be limited to methods which will simply tend to reduce the circulation in the sac and thus favor the coagulation of its contents. This may be accomplished by any of the classical methods of wiring or by narrowing the lumen of the vessel immediately above or below the aneurysm, by the use of constricting agents, whether metallic (Halsted or Matas-Allen aluminum bands), or tissue strips (aponeurosis, Nassetti; aortic, Halsted), or by suture methods, such as the plicating procedure which has been the special object of the authors' investigations.

29. **Gastric and Pancreatic Carcinoma.**—The conclusions gathered by Schumann from a review of the literature are that secondary invasion of the pancreas is a somewhat infrequent sequel of pyloric or duodenal carcinoma and that in a certain group of cases, in which the pancreas is attacked early in the course of the disease, there may arise a mutual functional compensation between stomach and pancreas, which permits both organs to satisfactorily perform their duties, with a decided absence of symptoms of disease of either, even though there may be extensive destruction of tissue.

31. Abstracted in THE JOURNAL, Jan. 4, 1913, p. 73.

36. **Purpura of Bladder.**—Kidd cites a case of secondary purpura confined to the bladder and arising in a bacterial infection of the tonsil. The patient, female, aged 12 years, was admitted to the hospital with the history that on Nov. 29, at 8 p. m., she felt a sudden desire to pass water and during the act experienced a sharp stabbing pain starting in the left iliac region and spreading into the vulva. Between 8 p. m. and 9:30 p. m. she passed water four times, each time noticing a similar pain which lasted only as long as water was passing and ceased at once at the end of the act. At 9:30 p. m. she passed water again and this time inspected it. It was full of blood. An aching pain came on in the left iliac region when she went to bed and lasted all night and the whole of the next day. Urine was passed once in the night and five times during the next day to the time of admission into the hospital at 5 o'clock in the afternoon. The patient looked ill and was pale and anemic. Temperature, pulse and respiration normal. Tongue clean and moist. Heart, lungs and alimentary system normal. There was a follicular tonsillitis on the left side and some slight enlargement of the lymph-nodes on the left side of the neck which were tender to the touch. The skin showed no petechiae. The gums were healthy. There was deep tenderness over the bladder region, especially on the left side. The urine was full of blood-clots and contained bright red blood diffused throughout. The patient was put to bed. By the next morning the bleeding had disappeared and the pain had ceased.

Further examination elicited the following facts: Roentgenoscopy was negative. Cystoscopy: The bladder was filled with 8 ounces of oxycyanate of mercury solution 1 to 4,000. Both ureters appeared healthy. The bladder wall for the greater part appeared pale and healthy, but scattered irregularly over fundus and trigone were seen patches of submucous hemorrhages varying in shapes and sizes, some linear, some stellate. The greater number were scattered over the fundus. There was no ulceration and no sign of miliary tubercles. Kidd came to the conclusion that it was either a purpuric condition of the bladder wall or a primary blood-infection of tuberculosis at its very onset.

Archives of Ophthalmology, New Rochelle, N. Y.

September, XLII, No. 5, pp. 457-575

37 Keratoconus with Reports of Cases. J. E. Weeks, New York.
38 Experimental Production of Sclerokeratitis and Chronic Intra-Ocular Tuberculosis. F. H. Verhoeff, Boston.
39 Two Cases of Chronic Glaucoma Simplex Treated by Iridotasis. D. Harrower, Worcester, Mass.
40 Case of Microphthalmus with Orbital Cyst; Partial Microphthalmus with Intra-Ocular Changes. F. P. Calhoun, Atlanta, Ga.
41 Case of Traumatic Equatorial Rupture of Sclera. A. Knapp, New York.
42 Treatment of Trachoma with Iodic Acid. J. Rudas, Budapest.
43 Method to Keep Upper Eyelid and Superior Fornix Everted. V. Grönholm, Helsingfors, Finland.

Boston Medical and Surgical Journal

September 11, CLXIX, No. 11, pp. 373-408

44 Gonococcus Vaccines and Glycerol Extracts of Gonococcus in Diagnosis of Gonorrheal Infections. G. C. Shattuck, Boston, and W. S. Whittemore, Cambridge.
45 Pathologic Lesion of Whooping-Cough. F. B. Mallory, Brookline, Mass.
46 Adductor Response to Homolateral and Contralateral Stimulation. A. Myerson, Boston.
47 Fibroma of Ovary Weighing Thirty-Five Pounds. Operation. Recovery. R. S. Titus, Boston.
48 Tests for Renal Function Based on Selective Excretory Activities of Kidney. R. Fitz, Boston.

Canadian Medical Association Journal, Toronto

August, III, No. 8, pp. 643-738

49 Clinical Significance of Autonomic Nerves Supplying Viscera and Their Relation to Glands of Internal Secretion. L. F. Barker, Baltimore.
50 Cancer. T. S. Cullen, Baltimore.
51. Diagnosis and Treatment of Acute Mastoiditis. G. H. Mathewson, Montreal.
52 Diagnosis of Tuberculous Bronchial and Mediastinal Lymph-Nodes. J. H. Elliott, Toronto.
53 Free Suppurative Peritonitis Due to Pyosalpinx. J. Halpenny, Winnipeg

September, III, No. 9, pp. 739-834

54 Pituitary Extract in Obstetrical Practice. B. P. Watson.
55 Intussusception, Its Diagnosis and Treatment, with Report of Seven Cases. A. E. Garrow, Montreal.
56 Insanity and Its Relation to State. C. K. Russel, Montreal.
57 Pain as Symptom in Pulmonary Tuberculosis. R. C. Paterson, Montreal.
58 Retroperitoneal Hematoma as Cause of Intestinal Obstruction. A. R. Mader, Halifax.

Journal of Medical Research, Boston

August, XXVIII, No. 3, pp. 403-598

59 Effect of Different Anesthetics on Pathology of Kidney in Acute Uranium Nephritis. W. deB. MacNider, Chapel Hill, N. C.
60 Morphologic Changes in Tissue with Changes in Environment. Replacement of Surface Epithelium of Grafted Tissue by Adjacent Epithelium. G. M. Smith, St. Louis.
61 *Studies on Complementary and Antihemolytic Properties of Normal Sheep-Serum. F. M. Surface and G. C. Routt, Lexington, Ky.
62 Studies in Metabolism: Selective Action of Certain Bacteria on Peptone. A. I. Kendall, A. A. Day and A. W. Walker, Chicago.
63 *Association of Tuberculosis and Malignant Growths. W. H. Harris, New Orleans.
64 Primary Sarcoma of Liver of Rat Originating in Wall of Parasitic Cyst. F. D. Bullock and G. L. Rohdenburg, New York.
65 Activity and Fixability of Complement in Rat Serum. J. A. Kolmer, C. V. Yui and E. S. Tyau, Philadelphia.
66 *Intravascular Implantation of Rat Tumors. R. Weil, New York.

61. **Properties of Normal Sheep-Serum.**—Surface and Routt found that fresh normal sheep-serum contains a complement capable of dissolving sensitized sheep corpuscles. Sheep-serum is relatively poor in hemolytic complement. It rapidly loses its complement ability on standing. Fresh normal sheep-serum is able to prevent the action of guinea-pig complement. In the fresh serum this inhibiting property is partially masked by the native complement in the sheep-serum. If the sheep-serum is heated just sufficiently to destroy its complement the inhibiting property remains and can be clearly demonstrated. Heating the sheep-serum to temperatures below 52 C. increases its inhibiting properties. Heating at temperatures higher than this tends to destroy this property. If the serum is heated to 60 C. or beyond, both its complement and its antihemolytic property are destroyed. There is an apparent auxilytic action of the guinea-pig complement on the complement of the sheep-serum. This inhibiting property of sheep-serum is not due to complement fixation by antibodies in the hemolytic rabbit-serum. It is probably not due to any precipitate which may be formed by the mixture of guinea-pig and sheep-serum. The evidence indicates that there is a true anticomplement (against guinea-pig complement) in fresh normal sheep-serum. This is present in relatively small amounts, and most of its action is masked by the sheep complement. If the complement is removed from the sheep-serum the anti-complement becomes manifest. The anti-complement is destroyed by heating at 60 C. and higher.

63. **Tuberculosis and Malignant Growths.**—Harris cites the case of a man 45 years of age who presented clinical signs and symptoms indicative of laryngeal neoplasm. The lungs and other organs were normal as far as could be determined by clinical methods. Repeated sputum examinations showed no acid-fast bacilli present; the Wassermann reaction was negative. Operation was decided on, and when the initial incision was made, an irregular growth was seen protruding just between the junction of the thyroid cartilages. Microscopic section showed it to be a distinct epidermoid carcinoma, and a complete laryngectomy was performed with removal of the adjacent lymph-nodes, which latter, however, appeared normal. When the larynx was laid open by a longitudinal incision along the anterior junction of the thyroid cartilages it showed in the gross a definite nodule located just to the left of the median line on the inner side of the thyroid cartilage. The tumor had penetrated the structures and projected slightly on the external surface. It measured 3.5x3x5 centimeters, was of a gray color and presented an irregular surface and outline.

A sectioned surface from within outward through the nodule and the underlying cartilage showed the external gray

color extending for a depth of .5 centimeter toward the interior, after which was an area of white color suggesting in certain places caseation which extended down to the cartilage. Between the two zones was an irregular line of demarcation, the white area extending by irregular projections into the overlying gray or tumor zone. The whitish zone which represents the tuberculosis infiltrated considerably beyond the limits of the tumor in the space between the mucosa and the cartilage. The accompanying glands of the excised larynx were normal in size and in appearance.

Microscopic study of serial sections from the summit of the nodule to the cartilage and also of the area immediately surrounding the tumor mass showed the following: the gray zone described in the gross was a distinct epidermoid carcinoma of the spino-cellular type. The deeper cells of the neoplasm were quite rounded and were deeply stained, while the upper part showed more flattened cells with oxyphilic protoplasm, among which were numerous epithelial pearls or "birds' nests." In the stroma of the lower portion were seen epithelioid cell infiltrations with lymphoid and plasma cells scattered here and there. These infiltrations arose from underlying well-defined miliary tubercles, which latter presented a central area of caseation with circumferentially arranged epithelioid cells, a few plasma and lymphoid cells and an occasional giant cell. There was an attempt at repair of these miliary tubercles as evidenced by the connective tissue zone surrounding them. A few scattered tubercles and a diffluse tuberculous infiltration were present beyond the tumor's margin extending between the mucosa and the cartilage. Smears from the caseous areas when stained by Gabbett's method showed a few acid-fast bacilli present. Microscopic study of the lymph-nodes revealed nothing abnormal.

It is now over one year since the time of operation and no evidences of recurrence of either condition are present. The patient has gained over thirty pounds in weight, is of a ruddy color, and apparently in the best of health. It is Harris' impression that the tuberculosis formed a primary pathologic soil on which the tumor probably thus provoked continued to flourish and the tuberculosis in part yielded.

66. Intravascular Implantation of Rat Tumors.—The intravascular implantation of tumor tissue was studied by Weil in connection with two types of tumors, a sarcoma and an adeno-carcinoma (Flexner-Jobling strain). A small, non-ulcerated, non-necrotic tumor was aseptically removed and cut into minute pieces, so that eventually the mass appeared to have the consistency of a mush. To this mush were added ten parts by volume of .85 per cent. of salt solution. The mixture was thoroughly shaken for a few minutes, and then allowed to stand until the larger particles had settled. The supernatant fluid contained large numbers of isolated cells and a smaller number of cellular masses, composed of aggregates of from three to fifteen or more individual cells. This material passed easily through the needle that was used, and was apparently very well borne by the rats. The injections are made into the external jugular in quantities ranging from 0.5 to 1 cubic centimeter. Only two animals of the entire number treated in this manner died within a few minutes of the injection.

Twenty-one normal rats received intravenous injections of sarcoma suspension. Of these, sixteen presented on autopsy macroscopic evidence of pulmonary tumors. Of the five which failed to show pulmonary tumors three were killed within fourteen days of the injection, and of these three two showed tumors on microscopic examination. Therefore, sixteen of the eighteen rats that were examined more than two weeks after injection presented visible tumors. The size and the number of these pulmonary plants varied within wide limits in any one series, depending on the length of time that was allowed to elapse between the injection and the autopsy. In the earliest specimens the lung appears dotted over with numerous whitish points no larger than the head of a pin. In the later specimens, up to four weeks or more, the tumors have reached the size of peas, are partly confluent, and occupy a very considerable area of pulmonary tissue. These larger tumors, when cut through, present the typical central necrosis which is so characteristic of the subcutaneous plants. There are few other changes of importance. Exceptionally, there is some pulmonary congestion, but never, so far as this series permits of generalization, any pleurisy, either fibrinous or serous. In lungs occupied by fairly large tumors there is often moderate emphysema, and not infrequently there are areas of consolidation, or of hemorrhage in the immediate environment of the tumors. The other viscera show no marked changes.

Journal of Outdoor Life, New York

September, X, No. 9, pp. 257-287

67 Day Camp Costs and Results: Comparative Study of Five Camps in New York. G. J. Drolet, New York.
68 Suitable Cases for Day Camp Treatment. L. B. Mackenzie, Middletown, N. Y.
69 Eligibility for Admission to Day Camps. F. Erdwurm, New York.
70 Some Medical Results of Day Camp Treatment. F. M. Class, New York.
71 Social and Educational Activities of New York Day Camps. J. B. Harriman, New York.
72 Present Status of Day Camp in Treatment of Tuberculosis. A. K. Stone, Boston.

Maine Medical Association Journal, Portland

September, IV, No. 2, pp. 1501-1544

73 Value of Preoperative Study in Major Genito-Urinary Surgery. J. H. Cunningham, Boston.
74 Alcoholic Psychoses. F. C. Tyson, Bangor.

Medical Record, New York

September 6, LXXXIV, No. 10, pp. 415-460

75 Lead-Poisoning in New York City. J. S. Kenney, New York.
76 Psycho-Analytic Delusion. J. V. Haberman, New York.
77 Is There Value in Electrotherapeutics? W. Martin, Atlantic City, N. J.
78 Two Cases of Pancreatic Lesions. J. Meyers and E. G. Benson, Albany, N. Y.
79 Extreme Enlargement of Cavum Septi Pellucidi. W. F. R. Phillips, Mobile, Ala.
80 Ludwig's Angina: Clinical Report of Case. S. H. Brown, Philadelphia.
81 Direct View Irrigating Urethroscope for Diagnosis and Treatment. D. Geiringer, New York.
82 New Salvarsan Needle. J. H. Stevens, Boston.

September 13, LXXXIV, No. 11, pp. 461-506

83 Oral Sepsis. F. P. Kinnicutt, New York.
84 *Clinical Studies on Curative Action of Leukocyte Extracts in Infective Processes. P. H. Hiss and J. G. Dwyer, New York.
85 Chronic Mesenteric Ileus, with Report of Three Cases. T. B. Spence and H. F. Graham, Brooklyn.
86 *Potassio-Mercuric Iodid. D. MacFarlan, Philadelphia.
87 Medicine's Need of Cerebellum. W. B. Konkle, Montoursville, Pa.
88 Dysmenorrhea from Imperfect Development of Uterus or Malformation. J. F. Baldwin, Columbus, Ohio.
89 *Case of Varicose Ulcer Treated by Feeding It with Cheese. G. O. Williams, Greene, N. Y.
90 Intestinal Hemorrhage in Tuberculous. J. M. Crulce, Philadelphia.

84. See abstract 34, p. 622, in THE JOURNAL, Aug. 23, 1913.

86. Potassio-Mercuric Iodid.—MacFarlan recommends this drug as being a most effective antiseptic. For purulent ophthalmia, 1 to 10,000 is a good dilution; for ordinary antiseptic work, 1 to 2,000 will be applicable. It has a marked influence when diluted 1 to 2,000 in alcohol and used on a swab when locally applied in diphtheria and scarlet fever in reducing the infective inflammation. In erysipelas the local application stops the mischief most rapidly.

89. Treatment of Varicose Ulcer.—Williams cites the case of a large, stout woman, aged 50, doing ordinary farm and dairy household work, whose leg was swollen from old phlebitis and was covered with abundant varices. The leg was abraded Feb. 1, 1913, at the junction of middle and lower third anteriorly and a deep ulcer followed. On May 1 this ulcer measured 2 by 3 inches, and the whole leg and foot were swollen. The patient was unable to abandon her work and give the leg a rest. The general treatment was by means of Blaud's pill.

Local treatment: Soft, well-ripened full cream cheese to which was added a mixture of equal parts of cream and water. The whole was worked into a soft mass. The water and cream were added to prevent drying. This was kept in an ordinary jelly glass. Some of it was spread on a piece

of gauze large enough just to cover the ulcer. The application was made morning, noon and night. The patient continued all her domestic duties. The application was painful for the first hour or hour and a half; then the pain subsided and the sore was comfortable until the cheese dissolved. When the empty gauze settled down on the sore it was irritating. The cheese disappeared in five or six hours. The ulcer filled rapidly. May 20 the ulcer was fully healed, no scab even remaining. Williams suggests that it is possible that the salt in the ripe cheese may be responsible for the pain of the application. Patients have not reported as much pain with the soft unsalted cheese curd, though the progress has not been as rapid as in the present case.

Mississippi Medical Monthly, Vicksburg

September, XVIII, No. 5, pp. 87-102

91 Surgery of Appendix. J. W. Barksdale, Winona.
92 Pleurisy of Children. P. R. Brown, West Point.
93 Calcium Sulphid. H. C. Buck, Friars Point.
94 Epithelioma of Ocular Conjunctiva with Presentation of Specimen and Patient. R. Fagin, Memphis, Tenn.

New Jersey Medical Society Journal, Orange

September, X, No. 4, pp. 167-220

95 Social Side of Syphilis. E. E. Worl, Newark.
96 Skin Lesions of Syphilis. C. H. Purdy, Jersey City.
97 Manifestations of Syphilis in Infancy and Childhood. J. Levy, Newark.
98 Syphilis of Eye. E. S. Sherman, Newark.
99 Treatment of Syphilis. H. A. Pulsford, South Orange.

New Orleans Medical and Surgical Journal

September, LXVI, No. 3, pp. 173-268

100 Sarcoma of Small Intestine. E. M. Williams, Patterson, La.
101 *New Self-Retaining Perineal Retractor. M. J. Gelpi, New Orleans.
102 Treatment of Trifacial Neuralgia by Intraganglionic Injection of Alcohol (Hartel's Method). U. Maes, New Orleans.
103 *Serodiagnosis of Pregnancy. C. Jamison and J. C. Cole, New Orleans.
104 *Treatment of Diphtheria and Diphtheria Carriers. S. G. Wilson, New Orleans.
105 Acidosis: Two Types Demonstrable—Endogenous and Exogenous. A. Eustis, New Orleans.
106 Pathology: Basis of Scientific Medicine. A. A. Herold, Shreveport, La.
107 Recent Interesting Work Seen in Laboratories Here and Abroad. W. H. Harris, New Orleans.
108 Hydrophobia and Pasteur Treatment. F. G. Ellis and W. B. Butler, Shreveport, La.
109 Diagnosis of Primary Anemias and of Leukemias. C. Jamison, New Orleans.

101. **Self-Retaining Perineal Retractor.**—Gelpi's retractor is composed of two sharp tenacula, so constructed that, when applied to the perineum, they remain securely in place, retracting the tissues on either side of the vaginal outlet, without the necessity of assistants to hold the tenacula where they belong. The instrument is simply a self-retaining double tenaculum. It is intended to take the place of the tenacula or Smith-hooks.

103. **Serodiagnosis of Pregnancy.**—The authors performed this test about sixty times on fifty patients. Three cases of known pregnancy from seventh to ninth month were positive. Three normal cases, from the first to the sixth day after delivery, gave positive reactions. Two ectopic gestations, ten days after operation, gave positive reactions. Two abortions, one three days after the birth of a six months' fetus, the other two months after abortion, with retained secundines, both gave positive reaction. (The latter case was about three months pregnant when the abortion was performed.) One stillbirth, ten days after delivery, gave a negative reaction. One patient with pernicious vomiting, who had not menstruated for two months, and where pregnancy was suspected, gave a positive reaction. One patient at the menopause, who had not menstruated for six months, and who was not pregnant, gave a negative reaction. Two large fibroids, negative. Six patients with pelvic inflammation gave a negative reaction. Ten women who were not pregnant gave negative reactions. These cases included malaria, syphilis, tuberculosis, suppurating abscess of tooth, typhoid, dermatitis herpetiformis, chronic interstitial nephritis, amebic dysentery and other intestinal parasites. Thirteen men gave negative reactions. These cases included typhoid, syphilis, amebic dysentery, uncinariasis, tuberculosis and minor complaints. Four normal men gave negative reactions.

One woman, suffering with acute nephritis and delirious, gave a positive reaction. At autopsy she was proved to be not pregnant. No control of this serum was made, and when they returned to get serum for another reaction the patient was dead. One man gave a positive reaction. The serum, however, was taken just after eating, and no control was made. The patient never returned to the clinic; therefore, his serum could not be retested. Jamison and Cole believe that the serodiagnosis of pregnancy is of definite value, and that when proper controls of the serum and placenta are made that the test is as reliable as any other serodiagnostic method.

104. **Treatment of Diphtheria.**—Wilson claims that the carriers are best treated by sunshine, segregation and "vaccine therapy." The best results in the treatment of the disease he says are obtained by large doses of concentrated antitoxin, 10,000 units being the initial dose, given intramuscularly, with a period of twenty-four hours between doses, the membrane being the chief guide for repeating the dose, except, of course, in the laryngeal type, and in this type the stenosis and cyanosis serve as guides.

New York Medical Journal

September 13, XCVIII, No. 11, pp. 561-518

110 Discarded Battleships to be Used as Sanatoria and Open-Air Schools. S. A. Knopf, New York.
111 Relative Value of Turtle Tuberculin in Treatment of Tuberculosis. W. J. Beattie, Littleton, N. H., and E. E. Myers, New York.
112 Hygiene of Skin. D. O. Robinson, New York.
113 Internal Causes of Skin Diseases. A. S. Clark, New York.
114 External Causes of Skin Diseases. G. M. MacKee and J. Remer, New York.
115 Therapeutic Value of Oral Prophylaxis and Treatment. G. F. Boehme, New York.
116 Botanic Family Physician. W. R. Riddell, Toronto, Ont.
117 Two New Tests for Detection of Defectives. H. A. Knox, Ellis Island, N. Y.
118 Cerebrospinal Meningitis. M. L. Ogan, New York.

Oklahoma State Medical Association Journal, Muskogee

September, VI, No. 4, pp. 139-182

119 Medical Aspect of Venereal Diseases. C. R. Day, Oklahoma City.
120 Infections of Hand. J. W. Riley, Oklahoma City.
121 Vaccines and Serums: Their Uses and Limitations. B. H. Brown, Muskogee.
122 Fee-Splitting Evil—Surgeon and General Practitioner—General Practitioner and Surgeon. D. A. Myers, Lawton.
123 Progressive Pernicious Anemia. L. A. Riely, Oklahoma City.

Ophthalmic Record, Chicago

September, XXII, No. 9, pp. 533-590

124 Management of Foreign Bodies in Eye and Orbit. E. Stieren, Pittsburgh.
125 Hole at Macula. A. A. Bradburne, Manchester, Eng.
126 Case of Spontaneous Dislocation of Both Lenses into Vitreous. J. C. McAllister, Ridgway, Pa.
127 Complete Bilateral Aniridia: Ectopia Lentis: Pathologic Cupping of Discs. T. B. Holloway, Philadelphia.
128 Case of Pulsating Exophthalmos. G. H. Mathewson, Montreal, Can.
129 Abscess of Lachrymal Sac in Child One Month Old. F. Holdsworth, Traverse City, Mich.
130 Case of Pemphigus of Conjunctiva. J. Bordley, Baltimore.
131 Cacodylate of Sodium in Case of Kerato-Iritis due to Lime Burn. F. Allport and A. Rochester, Chicago.

Washington Medical Annals, Washington, D. C.

September, XII, No. 5, pp. 255-277

132 Retrocalcaneal Bursitis. C. S. White, Washington, D. C.
133 Case of Pneumothorax. P. B. Johnson, Washington, D. C.
134 Potassium Permanganate as Local Anesthetic to Genito-Urinary Mucous Membrane. W. M. Barton, Washington, D. C.

West Virginia Medical Journal, Wheeling

September, VIII, No. 3, pp. 71-108

135 Surgical Treatment of Goiter. A. Crotti, Columbus, O.
136 Value of Blood-Pressure Estimation. J. J. Goff, Parkersburg.
137 Rupture of Liver. J. E. Cannaday, Charleston.
138 Indications for and Prognosis of Surgical Procedures in Epilepsy. J. R. Bloss, Huntington.
139 Earache. T. W. Moore, Huntington.
140 Present Status of Wassermann Test. S. L. Cherry, Clarksburg.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

August 30, II, No. 2748, pp. 329-384

1 Modern Methods in Diagnosis of Phthisis. C. Riviere.
2 *Nomenclature of Tuberculin Doses. J. A. Codd.
3 Difficult Diagnosis in Insane Person. R. Jones.
4 Treatment of Congenital Syphilis by Salvarsan. J. W. Simpson and L. Thatcher.
5 Physiologic Treatment of Pathologic Scoliosis by Rotation. A. M. Forbes.
6 Acute Pancreatitis: Its Causes, Symptoms and Treatment. A. J. Evans.
7 Sea Bathing. W. J. Tyson.
8 International Aspects of British Health Resorts. N. Wood.
9 Criticism of Methods of Treating Phthisis by "Climate." H. de C. Woodcock.
10 Massage in Fibrositis and Other Painful Conditions. R. Ackerley.
11 Distribution of Cancer Cases in Two Registration Districts of Northeast Cornwall. W. Gordon and W. F. Thompson.
12 Rationale of Plombières Douche. C. W. Buckley.
13 Climate of Brighton in Relation to Disease. E. Hobhouse.
14 Panniculitis. D. D. Brown.

2. **Nomenclature of Tuberculin Doses.**—Codd would select as a final unit the smallest dose likely to be given. For this unit a name must be found, and it should be an "unappropriated" Greek letter, with an associated word with meaning suitable to its minute dimensions. Therefore he suggests the letter ψ and the word psilon, which may be conveniently translated "shred," "residue" or "atom." Thus fractions may be obviated, the dose being given in psilons until it reaches the cubic millimeter, and then be given in cubic millimeters until it reaches the cubic centimeter. Another suggestion is the abolition of the practice of speaking of the dose of TR in terms of milligrams of the original bacillary substance, when three-fifths of that substance is no longer present. It is just like speaking of a dose of liquor strychninae, not as 5 minims, or as 1/20 grain, but as the original weight of nux vomica bean from which this quantity of liquid had been made. If, however, clinicians still wish to prescribe TR in terms of weight of the original bacillary substance, it would still be practicable to use the symbol ψ for 100,000 mg. of original bacillary substance of TR and its quantity would be the same as if the dose had been expressed in the Continental fashion—that is, in cubic centimeters of tuberculin fluid. In the method of prescribing tuberculin adopted at the General Hospital, Wolverhampton, they use the psilon unit and the cubic millimeter unit. The cubic centimeter unit is used only when the dose has attained unity or beyond. If this method were generally adopted, Codd says, it would render the use of tuberculin more popular and more intelligible to busy practitioners who do not give their whole time to unraveling these ponderously expressed fractions.

Edinburgh Medical Journal

August, XI, No. 2, pp. 97-192

15 *Psychologic Conception of Disease. A. J. Brock.
16 Trauma in Aggravation of Preexisting Disease. J. G. McBride.
17 Simultaneous Electro- and Phonocardiograms. H. L. Watson-Wemyss and J. D. Gunn.
18 *Case of Congenital Defect of Abdominal Muscles, with Anomaly of Urinary Apparatus. L. Thatcher.
19 Literature and Medicine. J. W. Ballantyne.
20 Local Incidence of Cancer in Relation to Fuel. C. E. Green.

15. **Psychologic Conception of Disease.**—Brock maintains that health consists in an effective, disease in an ineffective, reaction of the organism to its environment. Organisms moving in highly complex environments have developed a unique instrument of adjustment—namely, intelligence—to help them to deal adequately with such environments. Much of what, by a confusion of thought, is called "mental disease" is simply an abnormal reaction of such an organism to its environment—a misuse by it of this intellectual instrument of adjustment. *Natura non facit saltum.* Life proceeds cautiously, repeating again and again the reactions she has found serviceable, before proceeding to experiment further. The repetition, however, is for the sake of the advance; an organism which contents itself with marking time is doomed. Brock aims to demonstrate that certain diseases are best understood from a geneticopsychologic point of view, and that, accordingly, it is first and foremost by the employment of educational methods that we can best ensure the prevention of these diseases in the future. Some of the accompaniments of disease are not themselves, strictly speaking, pathologic. Thus inflammation may be looked on as a perfectly healthy and "normal" reaction to an extraneous stimulus of relatively infrequent occurrence. Or again, in the "mental" field, certain conduct on the part of highly gifted and far-seeing persons is often branded as "cranky" or even insane, when, as a matter of fact, it may have been necessitated by, or at least may form a quite healthy and useful protest against, certain pathologic manifestations in the social environment.

18. **Congenital Defect of Abdominal Muscles.**—On reflecting the skin of the abdominal wall Thatcher was at once struck by the almost complete absence of muscular tissue in the usual situations. Only for an inch or so below the costal margin was there any trace of the recti, each being represented by a thin indefinite band of fibers. Transverse sections through the normal position of the recti above and below the umbilicus, and also through the anterior part of the lumbar region, were stained by van Gieson's method, and no muscular tissue could be recognized in them. The psoas and other posterior abdominal muscles, the thoracic and perineal muscles and the diaphragm seemed normal. The apex of the bladder was attached to the region of the umbilicus by the remains of the urachus, which was only half an inch long, and took the form of a longitudinal band of fibrous tissue. There was also another cord-like band about an inch long which connected the anterior wall of the bladder to the anterior abdominal wall. The bladder was enormously dilated and hypertrophied. It measured 3 inches from apex to base, and 2 inches across at its widest part. When it was opened by an anterior incision, the wall was found to be between ¼ and ⅜ inch in thickness, and was very firm. The urethral and ureteral orifices were not dilated in any way, and a large probe passed easily from the bladder through the urethra, and vice versa. A fine probe could with difficulty be passed into the ureteral openings, and there was no sign of kinking. It had previously been found impossible to regurgitate urine from the bladder into the ureters by pressure over the viscus, although it could easily be expressed from the urethra. Similarly, on pressing over the ureters, the resistance was so marked that it was doubtful whether any urine passed on into the bladder or not.

Sections cut from the bladder wall in a longitudinal direction showed a great increase in the fibrous tissue elements in all three coats, especially the submucous. The muscular coat was much broken up by this fibrous tissue, the stroma penetrating it from the subperitoneal and submucous layers. The lining epithelium showed catarrh. Both ureters were greatly dilated and tortuous, closely resembling both in size and general appearance the small intestine which lay over them. The walls were thinned, and the dilatation ended abruptly at the bladder, for the intramural portion was very narrow. The ureters entered at their usual situation. They showed no sign of kinking, and were patent throughout. The right kidney was small, with marked hydronephrosis, the left about the usual size, with the pelvis but little dilated. In both the fetal lobulation was well marked. The suprarenals appeared healthy, and the relations between bladder and rectum showed no abnormality. Both testicles were found lying free just below the kidneys, and seemed normal in every way. The stomach was narrow and contracted, the bowel and pancreas normal, with no dilatation of any part of the former. The liver and spleen showed no change. There was no sign of recent or old peritonitis. In the right lung there were considerable patches of bronchopneumonia and collapse in all three lobes, this being the cause of death. The abdominal wall during life was very lax and the thorax markedly prow-shaped anteriorly. There was some asymmetry of the face and pinnae of the ears, and slight congenital dislocation of the hips. The urinary functions had been carried on quite satisfactorily, and the child had thriven well until it developed bronchopneumonia, of which it died at the age of 2 months.

Journal of Pathology and Bacteriology, Cambridge

July, XVIII, No. 1, pp. 1-148

21 *Spontaneous and Artificial Development of Giant-Cells in Vitro. G. C. Weil.
22 *New Method of Marking Paraffin Blocks for Purposes of Orientation or Identification. W. H. Harvey.
23 Regulation of Blood-Volume in Normal and Nephritic Animals. A. E. Boycott.
24 Action of Sugar Solutions on Glass. J. N. Laird.
25 *Epidemic Disease in Rabbits Resembling that Produced by B. Necrosis (Schmorl), but Caused by Aerobic Bacillus. J. M. Beattie, A. G. Yates and R. Donaldson.
26 Poliomyelitis in Sheep Suffering from "Louping-Ill." J. P. McGowan and T. Rettie.
27 *Thyroid. W. Edmunds.
28 Comparative Study of Chemical and Biochemical Properties of Lipoid Substances as Extracted from Pig's Liver and Egg-Yolk. F. P. Wilson.
29 Primary Tumors of Valves of Heart. G. Dean and A. W. Falconer.
30 Biochemical Reactions of Diphtheria-Like Organisms. T. G. M. Hine.
31 *Adrenal Hypernephroma in Adult Female Associated with Male Secondary Sex Characters. E. Glynn and J. T. Hewetson.
32 *Rate of Reproduction of Various Constituents of Blood of Immunized Horse after a Large Bleeding. R. A. O'Brien.
33 *Alterations Produced in Complement-Containing Serums by Introduction of "Lecithin." J. Cruickshank and T. J. Mackie.

21. **Development of Giant-Cells in Vitro.**—In observations on cultures of spleen tissue Weil observed that the presence of foreign particles caused a definite sequence in the migration of different forms of the wandering cells. The polymorphonuclear leukocytes were the first cells to respond and to aggregate themselves about foreign masses. These were shortly followed by lymphocytes. Following these at an interval of from twenty-four to forty-eight hours, there appeared a large mononuclear and protoplasmic cell which had the characters of an endothelial cell. By the time of the appearance of this cell, some of the polymorphonuclear cells were undergoing disintegration. These large endothelial cells had phagocytic qualities and tended to surround the foreign particles in the medium. By keeping accurate records of the numbers of cells migrating to a point it was possible to account for the number of nuclei (within a narrow limit of error) of the cells which migrated to the part. This count was compared with the numbers of nuclei determined in stained sections at the end of the observations. Weil has not observed the fusion of cells to form multinucleate ones, save when the cells involved were undergoing degeneration. When this process of fusion occurred, the cells did not exhibit subsequent phagocytic activity. He has, however, obtained multinucleate characters in cells lacking any sign of degeneration and still showing power to engulf foreign particles. These giant-cells were obtained in a process of nuclear division without visible protoplasmic change. It would thus appear from Weil's observations that *in vitro* the multinucleated cell arising from the large mononuclear endothelial cell has the same mode of origin as the multinucleate cells of fixed tissues as are constantly observed in cultures of connective- and muscle-tissue cells.

22. **New Method of Marking Paraffin Blocks.**—Harvey's procedure consists in embedding in the same paraffin block as the tissue a thin pencil of colored paraffin wax having a melting-point somewhat higher than that of the embedding mass. While this mass is molten, a length of colored wax pencil, sufficiently long to project above the block molds, is placed vertically in the liquid wax in any desired relation to the tissue; this projection of the pencil renders manipulations more easy. The block is then cooled, all protruding paraffin pencil is broken off, and the block is ready for cutting. By this means a clear and definite mark obtains throughout the depth of the block.

25. **Epidemic Disease in Rabbits.**—The epidemic disease in rabbits which the authors describe and which resembles so closely in its morbid anatomy the disease produced experimentally by the inoculation of Schmorl's bacillus is caused by a bacillus which in many of its morphologic characters is similar to *B. necrosis* (Schmorl), but which differs from it in two essential points—its motility and its aerobic character.

27. **Thyroid.**—Edmunds asserts that the thyroid in dogs hinders the assimilation of sugar: the parathyroid glands favor it.

31. **Adrenal Hypernephroma and Sex Characters.**—Abnormal sex characters do not always occur together with adrenal hypernephroma; the present position of our knowledge concerning their relationship to these tumors is summarized by Glynn and Hewetson as follows: 1. In children they are almost invariably present in the form of hirsutes and often other abnormalities (seventeen cases of hypernephroma collected; in sixteen, namely, thirteen females and three males, sex abnormalities present). 2. In adult females before the menopause they are frequently present (twelve cases collected; sex abnormalities present in seven, while in two others menstrual disturbances occurred before death). 3. In females after the menopause they are not recorded, though a growth of hair on the face or change in the voice, etc., might be thought worthy of note (eight cases collected). 4. In adult males they are probably invariably absent. In this connection it is of great interest that adrenal cortical rests or bilateral hyperplasia of the adrenal cortex was noted in 15 per cent. of female pseudohermaphrodites, but in only 0.7 per cent. of male pseudohermaphrodites. 5. There is no evidence that hypernephroma in the kidney, which has totally different histologic structure from that in the adrenal, is ever associated with abnormal sex characters.

32. **Reproduction of Blood-Constituents.**—After taking 10 liters of blood from an immunized horse, O'Brien noted the following: The number of white cells varies widely and irregularly. Very small differences are found in the differential count. The hemolytic titer remains practically constant, showing variations of at most 10 per cent. from the initial figure. The total amount of salts present does not decrease, but may be increased 10 per cent. The content of all other blood constituents falls, the hemoglobin and number of red cells falling together to 50 or 60 per cent. of the initial figure. The color index of the new red cells remains at the normal figure. The curve of volume of the red cells does not correspond very closely with that of the number of red cells. The curves of total proteins and of diphtheria antitoxin show a fairly close relationship.

33. **"Lecithin" in Complement-Containing Serums.**—Cruickshank and Mackie found that the introduction of lecithin into complement-containing serum of the guinea-pig does not materially alter the complement dose; in the case of rabbit's serum the complement activity is frequently increased. The albumin fraction from a serum treated with lecithin is as actively hemolytic for sensitized corpuscles as the original complement, while the globulin fraction retains the property of effectively acting with ordinary albumin fraction. The addition of lecithin to ordinary albumin fraction after separation does not enhance the complement activity of the fraction. The lecithin must be mixed rapidly with the serum, or with the water used for dilution, in order to produce the effect described; slow admixture does not yield an active lecithin-albumin fraction. The albumin fraction of a serum treated with lecithin is "absorbed" by complement-absorbing agents; it can also replace complement in the Wassermann reaction. The activity of the lecithin-albumin fraction is dependent on the presence of "complement" in the original serum. Lecithins differ markedly with regard to their power to produce the alterations described; a large number of preparations are quite inefficient.

The authors consider that the experiments are of interest as having a bearing on the nature of complement action. It has been demonstrated that, by the use of certain lecithins, the character of the components of complement are markedly altered, and that the complement activity in the case of certain serums may even be increased. They are of opinion that the results cannot be explained by supposing that incomplete splitting of the complement occurs, nor, on the theory of Bronfenbrenner and Noguchi, that the lecithin activates the complement in the albumin fraction in the way in which, for example, alanin does in these authors' experi-

ments. They suggest that the lecithin acts by rendering active a component or complement which is normally present in an inactive or latent state. In the case of guinea-pig's serum this component resembles ordinary middle-piece in its properties, but differs from it in not being precipitable by the passage of carbon dioxid gas. Some modification of or addition to this theory is, however, necessary in order to explain the increase of complement activity which results with certain rabbit serums merely on the addition of lecithin.

Lancet, London

August 30, II, No. 4696, pp. 697-706

34 The Student's Number, Session 1913-1914.

Annales de Gynécologie et d'Obstétrique, Paris

August, XL, No. 8, pp. 449-496

35 *Experimental Radiotherapy of Ovaries. (Les résultats expérimentaux de l'irradiation des ovaires.) A. Lacassagne.
36 *Fatal Chorea during Pregnancy. (De la mort chez les choréiques pendant la grossesse.) G. Lepage.
37 *Diabetes and Pregnancy. A. Fruhinsholz.

35. Experimental Roentgen-Ray Exposures of the Ovaries.—Lacassagne found that only with high dosage was it possible to sterilize rabbits with the Roentgen rays; in dogs even this was not possible, a number of follicles persisting intact. He thinks that these results testify to the folly of applying the Roentgen rays to sterilize women, as the ovaries are less accessible to the rays in women than in animals. Even if it were possible to accomplish this with intensive exposures, the danger of injury of adjacent organs, intestines, etc., renders it impossible of application. At the same time it seems evident that the Roentgen rays have a special destructive action on the tissues of fibromas and myomas. They also seem to have a destructive action on the riper follicles, and consequently prevent the menstruation otherwise connected with these destroyed follicles. But the exposures must be repeated as other follicles mature. Consequently the practical conclusion from his research is that the exposures may prove useful in causing the retrogression of uterine fibromas; they may also interfere with menstruation by small doses of the rays applied regularly to act on the riper follicles as they develop.

36. Fatal Chorea in Pregnant Women.—Lepage's patient was a nervous Jewess of 25 at the second or third month of her second pregnancy. She complained of restlessness and insomnia and he noticed that there was a slight tendency to motor incoordination in her left arm. He advised her to go to a sanatorium, saying that isolation was needed and supervision of the tendency to choreic movements; no one else had noticed them at that time. She would not go to a sanatorium; the diet was restricted to milk and vegetables and sedatives were given but the disturbances progressively increased until by the end of two weeks there were maniacal excitement and intense, incessant chorea, pulse 110, no fever. An erythema developed on the left arm and chest and the sixteenth day there was incontinence of urine and feces. The latter symptom is universally regarded as of bad omen and the pregnancy was interrupted. The choreic movements diminished in intensity thereafter but the psychic disturbances continued, and the general condition grew rapidly worse, with jaundice, the liver painful and the uterine cervix was seen to be blackish. The woman died the eighteenth day after the first symptoms of the chorea. Lepage has been studying the literature on the subject, and gives summaries of twenty cases in which the women died with no attempt being made to evacuate the uterus. Eleven of the women were in their first pregnancy; five in the second, and two in the fourth. Mental disturbances had preceded the chorea in several cases and the pregnancy was at the third to the seventh month in a number; others had reached term.

In thirteen other cases the uterus had been emptied as a therapeutic measure. Only seven of the women were in their first pregnancy. In four cases the women died within twenty-four hours after the induced abortion; in three others at the third day and in two others at the tenth and twelfth days. The necropsy findings were always negative except for endocarditic lesions in a few cases; softening of the brain was also noted in a few. Only seven of the total thirty-three cases date since 1907. In another group of five cases of severe chorea in pregnant women, induction of abortion was followed by the subsidence of the chorea and recovery. One of these women was in a very serious condition when the uterus was evacuated; pulse 120, subdelirium, scarcely any sleep and an eruption resembling measles four days after the abortion.

A fatal outcome may be feared when the choreic movements are extremely severe, preventing eating and sleep and not yielding to sedatives; when mental disturbances precede or accompany the chorea; when the pulse and temperature run up, and there is a morbilliform eruption. Interruption of the pregnancy when this stage is reached is of little use but cannot be refused as a last resort.

37. Diabetes and Pregnancy.—Fruhinsholz has noticed that the children of diabetic women are liable to be large but they die either during delivery or in three or four days thereafter. There are other analogies with syphilis; both entail an "inaptitude for life" although the new-born child may be large and appear to be healthy. Women should be examined for both syphilis and diabetes when the fetus dies near term or at or soon following delivery. On the other hand, diabetes does not entail abortion so regularly as syphilis, and while therapeutic measures may have a decided influence in restoring conditions practically to normal in case of syphilis, with diabetes the circumstances are not so favorable. It seems impossible to act favorably on the fetus of a diabetic woman by any treatment given her. He insists consequently that diabetic women should be warned against conception. A pregnancy is almost certain to aggravate the diabetes, while there is little hope of a healthy offspring. The child is almost inevitably doomed to die at or almost immediately following its birth.

Archives des Maladies de l'App. Digestif, Paris

July, VII, No. 7, pp. 361-420

38 Occult Hemorrhage in the Stomach or Intestines. (Critique expérimentale de différents procédés en usage pour la recherche des hémorragies occultes du tube digestif.) G. L. Hallez. Concluded in No. 8.
39 *Hereditary Nature of Gastric Ulcer. F. Dauwe.
40 Perforation of Gastric Cancer: Twelve Cases. Jaisson.

39. Heredity of Gastric Cancer.—Dauwe reports eight cases in which the father or mother of the patient had also had ulceration in the stomach at some time. The tendency to recurrence, to excessive gastric secretion, and the development of the ulcer at an early age are special features of these hereditary cases. A hereditary tendency was evident in about 25 per cent. of all his gastric ulcer cases. Accepting a peptic origin for the cancer, and accepting a primary hypersecretion as responsible for the peptic corrosion, the gastric ulcer is thus traced to an indirect nervous origin, which readily explains any hereditary tendency.

Archives de Médecine des Enfants, Paris

August, XVI, No. 8, pp. 561-640

41 *Spastic Paraplegia in Inherited Syphilis. A. B. Marfan.
42 *Influence of Heat on Puppies. G. Schreiber and H. Dorlencourt.
43 Cancer in Mediastinum in Child of 13. J. Hallé and H. Salin.
44 Static Ataxia as Early Sign of Tuberculous Meningitis. (Les troubles de l'équilibration dans la méningite tuberculeuse.) A. d'Espine.
45 *Epilepsy in Children. J. Comby.

41. Spastic Paraplegia in Older Children Due to Inherited Syphilis.—Marfan describes a form of spastic paraplegia for which inherited syphilis is responsible. In the first case of the kind he encountered (1894) it developed slowly and progressively in a boy of 8, and a syphilitic origin was suspected but no benefit was derived from specific treatment. In several of the six cases he reports the Wassermann reaction was positive. Left untreated, this heredosyphilitic paraplegia continues an inexorably progressive course, and when the lesions have been long installed the destruction wrought is irreparable. In his first case no benefit was derived from either mercury or iodid. After the discovery of salvarsan, he began to treat this patient with it, and this has apparently arrested the progress of the disease as it has been stationary since.

If treatment is commenced in the early stages of the paraplegia, there is every prospect of its arresting the progress and possibly realizing a complete cure.

On account of the hopefulness of early treatment and the slight chance of influencing the paraplegia after serious lesions are once installed, the early recognition of the condition is of extreme importance. It should be suspected whenever a child limps or shows any other disturbance in his gait. The paraplegia commenced in all his cases between the ages of 5 and 12. At first merely a very slight limp, the trouble beginning insidiously and slowly progressing until after a year or year and a half the child was unable to walk to school. The gait is of the spastic type; the child drags his feet, not lifting the toes, and he balances from left to right and right to left at each step. At first the disturbance may be more pronounced on one side. The legs are held stiff and lifted up all in one piece, the child finding it difficult or impossible to bend the hip, thigh and ankle. This difficulty in flexing the joints is the main disturbance in the gait. There is also a tendency to pes equinus and varus or valgus and the knees knock together. This spastic rigidity is scarcely appreciable when the child is seated or reclining. The legs are slightly rotated inward, with adduction, but they can be moved easily and the joints flexed except that as the foot is passively flexed upward the Achilles tendon may oppose a fibrous resistance.

The muscles are not weak nor hard nor atrophied, and the spastic rigidity of the legs is accompanied by only very slight paresis. But even in repose the tendon reflexes are seen to be much exaggerated and there is epileptoid trembling of the foot. Rubbing the front of the leg or tickling the sole induces the Babinski sign. The electric responses are normal or nearly so, and there are no sensory disturbances, no pains, no atrophy or weakness of the muscle. By the end of ten years in his first case the patient was then 18, and was unable to walk unless supported by another person, but the affection had not changed its character in any way; there were still no sensory or sphincter disturbances and no atrophy of muscles. Another differential point is that there are generally the pupil signs characteristic of syphilis. In three of his six cases there was interstitial keratitis and two of the children were mentally backward. Marfan discusses the pathologic changes in the spinal cord probably responsible for the paraplegia, but has had no opportunity to examine a case post mortem.

42. **Cool Baths in Excessive Heat.**—Schreiber and Dorlencourt tabulate some statistics which confirm anew the way in which babies die on days of excessive heat or the day after. They then report extensive research on puppies exposed to high temperature as in the summer heated term. The results confirm the directly injurious exclusive action of the high temperature, and that it is proportional to the height of the temperature. Both the naturally fed and the artificially fed suffered alike. Humidity in the air seemed to reduce the resisting powers. The puppies kept at 30 to 37 C. (86 to 98.6 F.) developed fever, with dyspnea and they lost flesh and were very restless. At 50 C. (122 F.) there was actual heat stroke, speedily fatal, but no digestive disturbances were noted. All the puppies died kept at a temperature of 40 C. (104 F.). In one series of experiments, artificially fed puppies had in addition to the other symptoms digestive disturbances, with diarrhea in two and vomiting in one. On the other hand, they found that cool baths had a marked influence on the overheated puppies, the temperature and the respiration returning to normal almost immediately. Even with pronounced heat stroke, the cool bath corrected conditions so that the puppy did not show any ill results from his experiences. The experiments all teach, they declare, the importance of immediate cool baths for infants suffering from the excessive heat, applying the baths extensively and energetically.

45. **Epilepsy in Children.**—Comby thinks that epilepsy is often acquired from some preventable cause. It is not a hereditary neurosis and hence should not be regarded as an inheritable taint. The ostracism of a family with an epileptic member, he declares, is based on misapprehension. Epilepsy is generally regarded as hereditary and incurable when in fact it is neither. In its various degrees it is common in children but it is rare in adults and extremely rare in the elderly. This can mean only that the children outgrow the tendency in time. Some comparatively insignificant obstetrical trauma is responsible for epilepsy later in many cases, he is convinced. The traumatic lesion may be so minute that it escapes the closest examination, but yet it is enough to bring on epileptic seizures while it does not manifest its existence in any way during the intervals. The effect of this obstetrical trauma, however, cannot be regarded as in any sense an inherited affection.

All the evidence to date is in favor of the assumption that there is always some lesion at the bottom of the epilepsy; it is not a neurosis but an organic affection of the nervous system. The lesion may have been acquired during intrauterine existence, but aside from the obstetric cases it is usually acquired after birth, and there is almost invariably a history of some more or less severe infectious disease affecting the brain. In some cases an accidental intoxication makes an impression on the brain enough to stamp it with the taint of epilepsy. He relates a case of this latter kind: A child of 3 slept in a room with a defective flue letting coal gas escape. After a winter of this he developed epileptiform attacks. They subsided during the summer, but after another winter of the coal gas he became a confirmed epileptic and the seizures have recurred regularly during the nine years since. The carbon monoxid evidently induced an acute and localized encephalitis which in its turn generated the epilepsy. In other cases Comby has known hemiplegia to follow coal-gas poisoning. Epilepsy consequently, he insists, is the result either of traumatic (obstetrical, etc.) origin, or it is due to encephalitis accompanying an acute infectious disease, or it is the result of the action of some poison.

Journal de Médecine de Bordeaux

August 10, LXXXIV, No. 32, pp. 511-524

46 Mechanism of Fracture of Lower Third of the Leg. (Du mécanisme en général des fractures du tiers inférieur de la jambe.) P. Bouvier.

Journal d'Urologie, Paris

August, IV, No. 2, pp. 169-340

47 *Removal of Bladder for Tumors. (De la cystectomie totale dans les néoplasmes multiples ou infiltrés de la vessie.) P. Heresco.

48 *The Nitrogen Output in Heart and Kidney Disease. (Le coefficient azoturique de l'urine dans les affections rénales et les cardiopathies.) J. Bret and R. Boulud.

49 Transformation of Cystic Cystitis into the Glandular Form. J. François.

50 *Why the Prostate Causes Symptoms. (Pathogénie de Prostatisme.) W. Deton.

51 *Treatment of Acute Epididymitis. (Sur les nouveaux traitements des épididymites aigues blennorragiques et en particulier de leur traitement par le sérum antimeningococcique.) E. Schmutz.

47. **Removal of the Bladder on Account of Multiple Tumors.**—Heresco comments on the gravity of the clinical outlook with the bladder filled up with a new growth, and also on the gravity of total cystectomy. But his experience with four cases in which he removed the entire bladder and sutured both ureters to the skin at the point of the incision has proved that this operative treatment may prove unexpectedly satisfactory. By bringing the mouths of the ureters close together in the hypogastric region one urinal suffices for both, and is easily managed by the patient. It permits also direct disinfection of the kidney pelvis on both sides. A long catheter is run into each ureter thus conveying the urine into the urinal which may be strapped to the leg. One of his four patients was a woman and she neglected to keep up the sterilizing injections into the kidney pelvis as instructed, and she succumbed ten months later to pyelonephritis. The trouble was a cancer in one of the other cases and this patient also succumbed after a few months to the progress of his malignant disease. But the two other patients are still in good health, one after more than two years, the other nearly as

long. The prostate is normal in both, the ureters permeable and the general health excellent. They were men of 50 and 45. The first had a diffuse infiltrated cauliflower-like cancroid nearly filling the bladder; the tumor in the second case so filled the bladder that even the finger could not be introduced. In this latter case the patient refused to allow the entire bladder to be removed until after two palliative operations. The final cystectomy was difficult and took an hour and a half and the postoperative weakness was extreme; only 100 gm. of turbid urine were voided in the following twenty-four hours. This amount slowly increased but the patient was tormented with singultus and vomiting two or three days and there was slight fever, but then the man began to improve rapidly as the kidney pelvis was rinsed out with a disinfectant three or four times a day for two weeks. This is almost the only technic for cystectomy which readily permits this repeated systematic disinfection of the kidney pelvis on both sides, and yet it is to this that the ultimate favorable outcome is due in large measure. Heresco found it an advantage to drain through the perineum after the cystectomy, and he also emphasizes the necessity for working the ureters loose as far up as possible before fastening them to the skin. Seven illustrations accompany the article.

48. **The Nitrogen Output in the Urine in Kidney and Heart Disease.**—Boulud states that study of additional cases with the necropsy findings has confirmed in every respect his statements in regard to the clinical and diagnostic importance of the index of the proportion of nitrogen in the urine. They were summarized in THE JOURNAL, 1912, lix, 1751. He now has a record of forty cases and he gives the details of each, with the post-mortem findings, and draws some general laws based thereon which throw light on the pathologic conditions of which the "azoturic coefficient" is one of the manifestations.

50. **Why the Prostate Causes Symptoms.**—Deton emphasizes that besides the loss of elasticity in the prostate and its enlargement, elderly people have to contend in addition with a reduction in the expelling force of the bladder. This latter factor should not be overlooked in study of "prostatism."

51. **Antimeningococcus Serum in Treatment of Acute Gonorrheal Epididymitis.**—Schmutz reviews the various measures in vogue for treating the complications of gonorrhea, particularly epididymitis, and relates extensive experience in his own and others' practice with antimeningococcus serum, particularly in France and Roumania. The serum is generally injected into the muscles of the thigh and three injections are usually sufficient. The spontaneous pain is the first symptom to subside under this serotherapy, the patients sleep well after the first night and the epididymis becomes less sensitive. The temperature drops the day after the injection as a rule, and the superficial inflammation loses its angry aspect. The deep tissues do not show much benefit until after two or three days, when the swelling of the parts begins to go down. The effusion in the vaginalis noticed in nine of fifty cases was all absorbed, and in some instances in forty-eight hours. By the tenth day the epididymis was soft throughout, except possibly for a tiny bunch still hard but not tender, and there is every reason to suppose that this will be absorbed in the course of time. In five of the six patients reexamined later, the epididymis was apparently normal in every respect but the sixth still had the tiny hard lump, probably retrogressing at the time. Schmutz therefore concludes his review by commending as superior this method of treatment; the only contra-indications, he says, are possible anaphylaxis, from preceding serotherapy, and mixed infection, which may annul the effect of the serotherapy.

Lyon Médical, Lyons

August 3, CXXI, No. 31, pp. 181-220

52 Intestinal Complications with Pulmonary Tuberculosis; Improvement after Radical Operation and Salvarsan. (Tuberculose iléo-cæcale hypertrophique chez une tuberculeuse pulmonaire.) Santy and L. Durand.

53 Chorio-Epithelioma. A. Pollosson and Violet. Commenced in No. 30.

August 10, No. 32, pp. 221-260

54 Syphilitic Aortitis with Symptoms of Insufficiency of the Left Ventricle. L. Gallavardin.

August 17, No. 33, pp. 261-296

55 Detachment of the Retina Improved by Simple Sclerectomy. L. Aurand.

August 24, No. 34, pp. 297-328

56 Advantages of the Phenolsulphonephthalein Test of Kidney Functioning. G. Mouriquand.

Presse Médicale, Paris

August 16, XXI, No. 67, pp. 677-684

57 The Laws of Physics Applied to Chemistry. (Le deuxième principe de l'exergétique et la chimie.) H. Guilleminot.

58 The Nitrogen in the Urine. (Métabolisme azoté urinaire.) L. Lematte.

August 20, No. 68, pp. 685-692

59 Serodiagnosis of Undulant (Malta) Fever. (Valeur de l'agglutination du micrococcus melitensis par le sérum sanguin, en particulier chez les chèvres.) Martel, Tanon and Chretien.

60 Improved Technic for Thiersch Flaps. (Quelques modifications à apporter à la technique des greffes d'Ollier-Thiersch.) P. Hardouin.

August 23, No. 69, pp. 693-704

61 Therapeutic Reflexes in the Large Intestine. (Contractions réflexes du gros intestin et réflexothérapie.) H. Lebon and P. Aubourg.

62 Cultivation of the Syphilis Spirochete and Skin Test. (La culture du spirochète pâle et la cuti-réaction dans la syphilis.) R. Burnier.

63 Improved Technic for Therapeutic Application of Radium. E. Vallet.

Revue de Gynécologie, Paris

XX, No. 6, pp. 545-640

64 *Diagnosis of Extra-Uterine Pregnancy. (Grossesse extra-utérine.) M. Chaput.

65 *Retroperitoneal Cysts Originating in Wolffian Body. (Kyste wolffien du mésocolon descendant.) C. Jacquot and C. Fairise.

64. **Diagnosis of Extra-Uterine Pregnancy.**—Chaput reports a case in which there was no sign of intraperitoneal hemorrhage, no hematocele anywhere and no disturbance in menstruation, but the diagnosis of extra-uterine pregnancy was rendered certain by attacks of intense pain, in the region of one ovary, the recurring paroxysms of pain being separated by intervals of entire freedom from pain. The paroxysms recurred unmodified by any and all measures to relieve the pain. In a second case there was a hematocele lying like a cap over the top of the uterus and not accessible to palpation through the vagina.

65. **Retroperitoneal Cysts Originating in Wolffian Body.**—Jacquot and Fairise report the details of a case in a girl of 18 with the minute necropsy findings and review thirteen other cases from the literature. The age of the patients ranged from a few months to 65 years. The embryonal origin entails a tendency to a malignant evolution while the complications of the tumor may prove directly fatal. Seven pages of bibliography are given and the necessity for prompt operative removal of such cysts is reiterated in conclusion.

Revue Mens. de Gynécologie, d'Obstétrique et de Pédiatrie, Paris

July, VIII, No. 7, pp. 425-464

66 Spina Bifida and Pregnancy. (Spina bifida et puerpéralité.) R. Gilles.

67 Electric Devices for Applying Moist Heat in Gynecology and Abdominal Surgery. (De l'emploi des compresses chauffantes électriques en gynécologie et en chirurgie abdominale.) R. Riss.

Semaine Médicale, Paris

August 27, XXXIII, No. 35, pp. 409-420

68 *Retention of Salt in Kidney Disease with Dropsy with Subnormal Salt Content of Blood. (Rétention chlorurée hypochlorémique dans les néphrites hydropigènes.) C. Achard and A. Ribot.

68. **Retention of Sodium Chlorid with Subnormal Content in the Blood.**—Achard and Ribot give a number of examples to show the variable effect of the ingestion of salt on the proportion eliminated in various diseases. In one of their cases a man with chronic interstitial nephritis, the kidneys impermeable to urea, with retention of nitrogen and extensive

edema, yet had only from 4.3 to 4.5 gm. of sodium chlorid per thousand in the blood-serum. In a second case a tuberculous young man with acute nephritis and dropsy had only 5.1 gm. per thousand of the chlorid in his blood-serum and two weeks later this dropped to 4.56 gm. In the peritoneal effusion, however, the proportion even with this latter figure was 5.1 gm., while the percentage of urea was practically the same in both serum and ascitic fluid. These facts and others related suggest that in the retention of salt in kidney disease hitherto unsuspected extrarenal factors are involved. These factors must evidently be sought in the tissues themselves and in the organic fluids.

Archiv für Gynaekologie, Berlin

C, No. 1, pp. 1-231. Last indexed July 5, p. 67

69 Relation of the Ovum to the Follicle Apparatus and of the Corpus Luteum to Menstruation. (Zur normalen und pathologischen Anatomie und Physiologie des Ovariums.) R. Meyer.
70 Ovulation, the Corpus Luteum and Menstruation. C. Ruge. II.
71 Anatomic Findings in Carcinomas after Exposures to Mesothorium and the Roentgen Rays. P. Haendly.
72 Familial Chondrodystrophy. G. A. Wagner.
73 The Clinical Status of Cancer of the Body of the Uterus. W. Weibel.
74 Placental Bacteremia. Warnekros.
75 Technic for Preventing Peritonitis after Operative Treatment of Rupture or Perforation of the Uterus; Eleven Cases. W. Sigwart.
76 The Histologic Diagnosis of Uterine Tumors. (Ueber histologische Geschwulstdiagnostik im Bereiche der Gebärmutter.) J. Schottlaender.

Beiträge zur klinischen Chirurgie, Tübingen

LXXXV, No. 1, pp. 1-238

77 Transplantation of Phalanx from Toe into Left Ring Finger. (Freier autoplastischer Phalangentausch in einem Fall von Riesenzellensarkom der Mittelphalanx des linken Ringfingers.) R. Sievers.
78 Tuberculin Treatment of Surgical Tuberculosis. H. Meyer.
79 Roentgenoscopic Diagnosis of Disease and Adhesions of the Large Intestine. (Zur Roentgendiagnostik der Dickdarmerkrankungen, speciell von Verwachsungen an demselben.) A. Welter.
80 Volvulus of the Large Intestine. E. Bundschuh.
81 *Ivory Prothesis Implants, with Screw-Thread, in Bones and Joints; Eight Cases. (Ueber die Implantation von Elfenbein zum Ersatz von Knochen- und Gelenkenden.) F. König.
82 Resection of Ileocecum for Invagination from Submucous Lipoma. K. Andrée.
83 Enchondroma of the Spine. B. Valentin.
84 *Splenectomy for Splenomegaly with Severe Anemia. (Zur Lehre vom Morbus Banti.) Grützner.
85 *Fascia Flaps and Implants. (Die freie Fascientransplantation.) P. Kornew.

81. Ivory Supports after Resection of Bone.—König says that tissue grows into an ivory implant in time, fastening it firmly and thus curing pseudarthrosis and similar aseptic lesions ideally. In an infected focus it does not heal in place so well and is liable to maintain the characteristics of a foreign body. He reports extensive experimental and clinical experience with eighty cases, profusely illustrated. Cutting a screw-thread and numerous small depressions in the ivory helps in its solidity after healing. In one of the cases an ivory artificial humerus was implanted; it locked in the shoulder joint and the lower end cut to a point set rigidly in the short stump of the patient's own humerus below. Sometimes he uses wire to hold the ivory implant in place. Eighteen illustrations accompany the article, including two of a woman of 68 whose left lower jaw had been replaced with an ivory prothesis which looks and works like a normal jaw and causes no disturbance.

84. Splenomegaly with Anemia.—Grützner's patient was a girl of 10 who had had rachitis and was under treatment for helminthiasis when the spleen began to enlarge and signs of a hemorrhagic diathesis followed, with progressive anemia threatening to prove speedily fatal unless something could be done to arrest it. The syndrome suggested Banti's disease but had not lasted long enough for cirrhosis of the liver and ascites to develop. The blood picture began to improve at once after the splenectomy and by the fifth day the reds had doubled in numbers and soon reached the normal figure. The blood picture has persisted normal during the year since. The spleen measured 19x12x4.5 and weighed 450 gm.

85. Fascia Grafts.—Kornew's article is based on both experimental and clinical experiences and fills ninety-four pages. Grafts of fascia heal finely in place, he states, irrespective of their size. A fascia graft is peculiarly useful to close gaps in the bone and muscle wall of the thorax and defects in the pleura. Also to reenforce hernia operations, a sheet of fascia having superior advantages for this purpose over all other methods. A fascia flap is often likewise the best means to close a defect in the abdominal walls, and is the method of choice for closing the internal femoral ring. A strip of fascia is also the best means to draw up the anus in treatment of prolapse of the rectum. Also for fixation of the testicle in case it rides up. Mobilization of the ankylosed mandibular joint is also possible with the aid of a fascia implant; in fact, this is by far the simplest and most effectual method for the purpose.

Berliner klinische Wochenschrift

August 18, L, No. 33, pp. 1509-1552

86 *Intestinal Auto-Intoxication. A. Albu.
87 *Beriberi. (Weiteres zur Beriberifrage.) W. Caspari and M. Moszkowski.
88 Radiotherapy of Tumors. (Zur Strahlentherapie der Geschwülste.) S. Loewenthal.
89 Comparison of Technics for Serodiagnosis. (Die Hermann-Perutz'che Reaktion im Vergleich zur Wassermann'schen Reaktion.) F. Bräutigam.

86. Intestinal Auto-Intoxication.—Albu reviews the present conceptions in regard to auto-intoxication from the intestines, and states that the new biochemical facts recently learned in regard to the internal secretions, hormones, etc., make it necessary to revise the conception of this subject on this new basis. Only when these newly acquired biochemical data are duly taken into consideration will the theories conform to the facts.

87. Beriberi.—Caspari and Moszkowski have been studying this subject for years and here relate the findings in metabolic research on Dr. Moszkowski extending over a period of 230 days, during which the main article in his diet was polished rice. In the course of time symptoms developed suggesting the cardiac form of beriberi. Positive experiments on pigeons and animals were conducted at the same time. In the pigeons, as also in the case of Dr. Moszkowski, all the symptoms subsided in an amazingly short time when small amounts of an extract of rice bran were given in addition to the previous diet. The metabolic findings showed in the course of the experiment great destruction of albumin, to be explained only as the result of severe intoxication.

There can be no doubt, they say, judging from these experiences, that beriberi is not the result of a deficiency in the diet but of some toxic plus, and thus it is essentially an intoxication. They think that the last link in the chain of evidence is provided by one of their numerous experiences: Pigeons were fed for months on hens' eggs with a little salt and sugar. The birds thrived and were in excellent health. Then some polished rice was added to the egg, and the pigeons every one developed polyneuritis after a longer or shorter interval while the controls remained healthy. The toxic substance causing the beriberi is not necessarily present in the food, they say; it may originate in the body under the influence of the polished-rice diet. This assumption is confirmed by the beneficial influence of purgatives which Abderhalden and Lampé have reported as almost constant in their research on polyneuritis in swine.

Correspondenz-Blatt für Schweizer Aerzte, Basel

August 16, XLIII, No. 33, pp. 1025-1056

90 *Therapeutic Compression of the Lung: Artificial Pneumothorax and Thoracoplastics. (Ueber Lungenkollapstherapie.) L. Spengler (Davos).
91 Thucydides' Plague probably Exanthematous Typhus. (Die Seuche des Thukydides.) F. Kanngiesser.

August 23, No. 34, pp. 1057-1088

92 Cases of Tuberculosis Adapted for Sanatorium Treatment. (Die Auswahl der Lungenkranken für die Heilstättenkur.) R. Dietschy.
93 *The Horsehair-Worm as Parasite of Man. (Gordius als Parasit des Menschen.) H. Herzog.

90. **Compressive Treatment of the Lungs.**—Spengler has had extensive experience with both artificially induced pneumothorax and operations to mobilize the chest wall and thus induce the compression of the lung. He tries to induce the pneumothorax first; only when this fails does he attempt the thoracoplastic operation. He gives the history of both operations and describes his technic and the indications for each. He has been able to trace to date all but five of the ninety-three patients he has treated with the therapeutic pneumothorax. Twenty-three, that is, 26 per cent., are clinically cured of their pulmonary tuberculosis; 41 per cent. have not quite completed the course, but the improvement to date is very encouraging. In only 21 per cent. was the desired result not realized, and in most of these cases the conditions prevented a complete pneumothorax. Thus favorable results were realized in sixty-nine of the eighty-eight, namely, in over 78 per cent. In eighteen other cases the chest wall was resected; the patients were thereby cured of their pulmonary disease in four cases and materially improved in twelve others; two died, one from the effect of the operation itself, the other from aspiration complications. Sauerbruch has a record of fifty-six cases of this kind without perforation of the cavity and twelve of the patients were cured, seventeen materially improved and fifteen improved, while the condition seemed to grow worse afterward in four cases and two patients died from the effects of the operation and six have died since from the progress of their disease. In ten cases in which the cavity had perforated, four were materially improved or cured and one is still under treatment; the others have died. This group includes three recoveries although the empyema had perforated into a bronchus or into the artificial pneumothorax. The cases with tendency to shriveling of the lung tissue are particularly adapted for the thoracoplastic technic, especially when the shriveling process is so pronounced that the trachea has been drawn to one side and there is some dyspnea. In two of Sauerbruch's cases of this type the dyspnea subsided after the plastic operation. The lower lobe must be compressed first.

93. **Horsehair-Worm as Human Parasite.**—Herzog reports a case in which the description of the worm passed in the stools seemed to agree with the description of the gordius, and a second case in which the worm was absolutely identified as the gordius. It was expelled in the stool of a boy of nearly 3, in company with several specimens of the oxyuris. He says that it is the nineteenth authentic case on record. The child had been nervous for a few weeks, complaining of abdominal pain and waking up screaming at night, but the appetite and stools were apparently normal except that five weeks before the gordius was expelled there had been blood in the stools. Whether the gordius or the oxyuris was responsible for this is a question. The child since the expulsion of the worm has been in constantly good health.

Deutsche medizinische Wochenschrift, Berlin

August 14, XXXIX, No. 33, pp. 1577-1624

94 *Pernicious Malaria. E. Marchiafava (Rome).
95 *Influence of Roentgen Rays on Experimental Pulmonary Tuberculosis. L. Küpferle and A. Bacmeister.
96 Serodiagnosis of Tuberculosis. (Anwendung des Dialyseverfahrens—nach Abderhalden—bei der Tuberkulose.) E. Fränkel and F. Gumpertz.
97 *Goats Born and Brought Up in Strictly Aseptic Conditions. (Die Gewinnung und Züchtung keimfreier Säugetiere.) E. Küster.
98 Anatomy of Nerves of Lacrimal Secretion and of Taste. (Verlauf der sekretorischen Fasern zur Tränendrüse und der Geschmacksfasern.) Blum.
99 Examination of Heart of Wrestlers. (Röntgenologische Herzgrössenbestimmungen an Ringern.) L. Katz and M. Leyboff.
100 Hydrotherapy of Pulmonary Tuberculosis. F. Köhler.
101 Cesarean Section for Premature Separation of Normally Located Placenta. (Kaiserschnitt bei vorzeitiger Lösung der regelrecht sitzenden Nachgeburt.) F. Spaeth.
102 Psoriasis a Symptom of Constitutional Bacterial Disease. A. A. L. Menzer.

94. **Pernicious Malaria.**—Marchiafava comments on the wonderful improvement realized in recent years in the campaign against malaria in Italy, especially in the extensive marshes around Rome. Scarcely a week passed in the old days without the necropsy of one or more cases of pernicious malaria at the San Spirito hospital, but last year, up to August 15, there had not been a fatal case. Cases of pernicious malaria still develop, however, in the malarial districts and he emphasizes the fact that persons acquiring malaria for the first time seem to be peculiarly prone to develop the pernicious type. This fact is sustained not only by the history of the cases—the sufferers are generally persons just arriving in the district—but also by the fact that the spleen in his cases of pernicious malaria was not much enlarged and the congestion and enlargement were evidently of quite recent date. The appearance resembles that of the spleen in typhoid fever, differing only in the melanosis and the extreme softness. In all his experience he never found the spleen chronically enlarged in a case of pernicious malaria. By the time the individual has developed the chronic enlargement of the spleen he has had time to become practically immunized against the pernicious type of the malarial infection.

In the pernicious form quinin fails as a rule because the parasites are in such numbers and probably extremely virulent; even if they are all destroyed by the quinin the organism is flooded with toxins to an extent incompatible with survival. The only dependence can be on prophylaxis, and he reiterates the importance of this. Every workman or other person going to a malarial district for the first time should be compelled to apply for the quinin preventive treatment the very first day of his arrival and should be instructed in the methods of prophylaxis without a day's delay. The pernicious type seems to be the work of the estivo-autumnal form of the malaria parasite and the thick-film method is particularly fine for showing them up. Marchiafava adds that examination of the blood should be a routine procedure in all malarial regions whenever there is persisting fever assuming typhoid characteristics; also in all cases of jaundice with more or less fever; in children with symptoms suggesting meningitis, and in diarrhea suggesting cholera, accompanied by fever. In this way it will be possible to detect the cases of pernicious malaria possibly in time for treatment to prove effectual. Examination of the blood is not necessary in cases of unmistakable malaria.

95. **Roentgenotherapy of Pulmonary Tuberculosis.**—Küpferle and Bacmeister have been conducting experimental research on rabbits with financial aid from the Koch Foundation, and report that only large doses of the hard Roentgen rays seem to be able to exert a favorable influence on the tuberculous process. The action of the Roentgen rays may be effectually reenforced by other forms of radiant energy, and other measures which resemble them in their action. In none of their experimental work was it possible to destroy entirely the tuberculous process, not even in the incipient cases. The tubercle bacilli themselves did not seem to be directly injured by the Roentgen exposures; animals inoculated with them afterward developed tuberculosis. But the fibrous transformation of the tuberculous tissue under the influence of the rays checks the growth of the tubercle bacilli in the focus and protects against their spread.

97. **Aseptic Mammals.**—Küster extracted the young of goats by Cesarean section about a week before term and brought them up under absolutely aseptic conditions. The kids developed as normally as the controls. He thinks that the possibility of thus bringing up large mammals under absolutely aseptic conditions opens a new field for scientific research. The kid was kept in an iron and glass box stall. The floor of the stall is funnel-shaped with a paraffin oil siphon to permit the removal of excreta without interfering with the sterility of the box. An aseptic anteroom with double doors contains an electric sterilizing apparatus for the food, etc. A pair of long rubber gloves is fastened germ-tight in the opposite walls of the box stall so that a person in the anteroom can run his arms into the gloves up to the shoulder and use his hands thus inside the stall. Two persons can thus work inside the stall at the same time. The air pumped into the stall is filtered three times through cotton, the last

time after it has been passed through concentrated sulphuric acid, after which the air is passed through an electric heater which heats it to 150 C.

The kid is thus kept in germ-free air and fed germ-free food; the great difficulty is to get the sterile kid into the box in a germ-free manner. The Cesarean section and extraction of the kid were done under a gauze tent kept constantly sprayed inside with hydrogen dioxid, the tent opening into the aseptic anteroom so that the kid was passed directly from the uterus to the gloved hands of the assistant in the anteroom. During the procedure the air pump was pushed to the utmost, the current of air thus sweeping through being so powerful that any germs floating in the air must have been carried out. The first kid soon died as both it and the control proved to be non-viable. The carcass dried up and was found bacteriologically sterile when examined after it had been left in the aseptic box for ten days. The second kid was kept in the aseptic box for forty-four days and continued to thrive after its release.

Medizinische Klinik, Berlin

August 17, IX, No. 33, pp. 1317-1358

103 *Dietetic Treatment of Cholelithiasis. (Die diätetische Behandlung der Gallensteinerkrankung.) H. Salomon.
104 *Treatment of Eclampsia. A. Wegner.
105 Mesothorium in Gynecology. W. Sigwart and P. Händly.
106 Limits of Conservative Surgery in Military Campaigns. (Grenzen der konservativen Behandlung in der Kriegschirurgie.) R. R. J. Klapp.
107 The Predisposition a Determining Factor in Diphtheria. (Diphtherie und soziale Lage.) F. Reiche.
108 Vaccine Treatment of Gonorrhea. A. Menzer.
109 *Treatment of Intermittent Limping. (Zur Therapie der Dysbasia angiosclerotica.) J. Pick.
110 Neosalvarsan. (Indikationen und Kontraindikationen der subcutanen Neosalvarsaninjektionen.) J. Fabry.
111 The Ions as Factors in Climate and Therapeutics. (Bedeutung der Ionen als therapeutische und klimatische Faktoren.) P. Grabley.
112 Experimental Research on the Possible Influencing of the Blood-Pressure. A. Selig.
113 *Helminthiasis. (Eine häufige Ursache verschiedenartiger Störungen.) G. Liebermeister.

103. Dietetic Treatment of Cholelithiasis.—Salomon remarks that there are few fields of dietetics in which such diversity of opinions has prevailed as in the management of gall-stone trouble. He adds that we cannot hope to dissolve the stones in the gall-bladder or drive them out into the intestines by any therapeutic means at our command. The best we can do is to keep the bile system healthy. The bile ducts are too small and the pressure of the bile too weak to hope to drive the stones into the intestine by any means to stimulate the production of bile. The presence of gall-stones tends to render the stomach abnormally irritable. This irritability is manifested by the same signs and symptoms which accompany hyperacidity in the stomach. He regards this as even more important than the fact that hyperacidity is frequently encountered with cholelithiasis. The tendency to excessive secretion is felt both in the stomach and in the gall-bladder, and the hypersecretion thus may start up pain from the gall-stones just as a hitherto pain-free felon begins to throb and pain when a wave of blood pours into it.

In any event, he declares, the dietetic management of cholelithiasis during the latent stage should be the same as for hyperacidity. Cold drinks should be carefully avoided; warm drinks may be useful and a little above the usual ration of fluid should be taken, up to 2 liters. Fat is well tolerated, as also in hyperacidity. Purgatives are often directly harmful, especially their chronic use, as also with gastric hyperacidity. The main point, however, in the treatment of both hyperacidity and cholelithiasis is to cure the tendency to constipation. Normal peristalsis of the bowel is unquestionably the best means for promoting the flow of bile. Constipation should be combated by coarse food and fruit; even at the risk of fatiguing the stomach, this dietetic regulation of bowel functioning should be sought as the main desideratum. Gradual and systematic training of the gastro-intestinal canal to proper functioning is the best means to influence the cholelithiasis. Obstinate attacks of pain and fever often disappear promptly and permanently when the constipation has been conquered. This suggests that stagnation of the bile is responsible for the attacks.

104. Treatment of Eclampsia.—Wegner comments on the way in which the principles of Stroganoff's prophylactic treatment are now being adopted in many places. The most important is the shutting out of all external irritation, all noises, bright light, chilliness, unnecessary contact and pain; isolation in a dark room is enforced, the convulsions aborted and kept under control with morphin, chloral and chloroform, delivery hastened but not forced and the respiration and functioning of the heart, kidneys and skin carefully supervised. Stroganoff reports only 7 per cent. mortality in 500 cases of eclampsia treated on these principles. This includes all the cases of sepsis, hemorrhage and pneumonia; the mortality of the children was 21 per cent. That this low mortality is not due to any special mildness of the eclampsia in Russia is shown by other statistics cited from the same city with a mortality of 18 and 20 per cent.

Wegner insists that close medical surveillance is necessary for women with eclampsia and they consequently should be sent to the hospital, the sooner, the better, giving a sedative for the transportation. If the woman has to be treated at home, he advises the Stroganoff method, supplemented by venesection, withdrawing at least 500 c.c. of blood. If delivery can be brought about without force, this should be done under a general anesthetic. He reiterates in conclusion that no fluid should ever be put in the mouth of an unconscious person, and adds that eclampsia without convulsions is usually the severest form.

109. Treatment of Intermittent Claudication.—Pick reports unusually fine results from his treatment of the disturbances of peripheral arteriosclerosis. It is based on the principle of reducing the viscosity of the blood, that is, the internal friction, and promoting the circulation in general by having the patient breathe under negative atmospheric pressure, thus magnifying the pumping effect of the expansion of the lungs. He meets these indications by having the patient inhale an iodin spray, supplementing the action of the iodin on the blood by means to impede to a certain extent the intake of air into the lungs. He brings the iodin spray into an air-tight mask with valve arrangement which does not permit quite free breathing but allows unimpeded expiration. The result is physiologically identical with that of breathing under negative atmospheric pressure. The patient has to make greater efforts to breathe to get enough oxygen in addition to the spray he is inhaling. When this combination of iodin and under-pressure breathing is applied repeatedly every day for several weeks, the patients find that they can walk without the intermittent attacks of inability to use the limb in question; the pulse becomes perceptible in the region once more and the limb feels warm. This warmth is felt over the whole body, showing that the effect on the circulation is general.

Patients with peripheral angiosclerotic dysbasia do not suffer from the intermittent disturbances so often or so severely when they are climbing a hill as when they are walking on level ground. Walking up hill is more exertion and they breathe deeper, thus promoting the circulation throughout. Pick trains his patients to walk and move generally more slowly; this postpones the vascular disturbance from the muscular exertion. Otherwise the lack of adequate oxidation and the accumulation of metabolic waste bring on such acute fatigue that inability to functionate follows. A few moments' rest, however, and the fatigue waste products are swept along and the conditions return to approximately normal. One patient came to him saying that he suffered from intermittent claudication in a severe form and had not been able to feel the pulse in his left foot for six years. He had consulted nearly every prominent physician in the country without relief. After four months of treatment with the iodin spray and the impeded breathing exercises to induce negative pressure in the chest, his leg felt warm, the pulse in the foot had returned and he scarcely ever had any further disturbance in his gait. He is still zealously keeping up the treatment, amazed at the benefit in the four months to date.

113. **Frequent Cause of Intestinal Disturbances.**—For the last two years Liebermeister has had the first stool examined of each patient admitted to the internal department of the Düren public hospital in his charge, and states that among the last 100 patients, twenty-one had ascarides' ova in their stools. In some previous series the proportion was still higher. In a number of the cases the disturbances on account of which the persons had been admitted to the hospital were directly dependent on the helminthiasis and as soon as this had been cured, they were restored to health. One obese woman required an emergency operation for incarcerated hernia and ileus; the hernia was corrected but the general condition was so bad that the ileus was left unmolested; necropsy revealed that a twisted mass of innumerable ascarides in the ileum was the cause of the obstruction. A lad of 13 had ileus and a large tumor could be palpated but under internal measures both subsided but returned two days later. The stools contained numerous ova of ascarides and two courses of treatment for helminthiasis led to expulsion of twenty-five ascarides and restoration to complete health. A third example of the evil for which helminths may be responsible was a woman of 50 who had been treated for a long time for "gall-stone colics" and was finally sent to the hospital for an operation. The discovery of ascarides' ova in the stools led to postponing of the operation until after a course of treatment for the helminthiasis, but this cured at one stroke the whole trouble.

He adds that in seven of the twenty-one patients with helminths in his last hundred, the helminths were responsible for all the morbid manifestations as the latter disappeared entirely under the dose of fourteen drops oil of chenopodium with one drop oil of peppermint, divided into three capsules. One capsule is taken each hour and a powerful purge four hours after the last capsule. Four days later he has the stool examined again and if ova are still found he repeats the course. More than two courses are rarely necessary, but in one case he repeated this treatment eight times, alternating santonin with the oil of chenopodium and more than fifty ascarides were expelled. Even then ova were still encountered in the stools. Liebermeister entitles his communication "A Frequent Cause of Various Kinds of Disturbances."

Münchener medizinische Wochenschrift

August 19, LX, No. 33, pp. 1809-1864

114 The Sense of Touch. (Einiges über den Tastsinn.) A. Basler.
115 *Pathology of the Adrenals. K. Helly.
116 *Endemic Goiter. (Studien über den endemischen Kropf.) T. Dieterle, L. Hirschfeld and R. Klinger.
117 Two Years' Experience with the Wassermann Test. F. Wesener.
118 Liver of Tuberculous Guinea-Pigs and Cattle as Antigen for the Wassermann Test. L. Hitter.
119 *Addison's Disease and Pregnancy. E. Vogt.
120 *The Danger in Combining Morphin with Anesthetics and Hypnotics. (Ueber die Gefährlichkeit der Kombination von Morphin mit allgemeine Narkose und mit Schlafmitteln.) W. Straub.
121 *Case of Fatal Poisoning of the Blood from Aurum Kalium Cyanatum. (Ueber tödliche Wirkung des Aurum Kalium Cyanatum als Blutgift beim Menschen.) L. Hauck.
122 Electric Treatment of Sciatica. (Zur Behandlung der Ischias.) Schurig.
123 *Seasickness and Vagotony. Friedländer.

115. **Pathology of the Adrenals.**—Helly reports a case in which, as in Kolisko's recently published case, a tumor found in an adrenal was the only probable explanation for the sudden death after a minor operation, merely pulling a tooth in Kolisko's case. In Helly's case the woman of 43 had a tendency to hypertrophy of the heart, high blood-pressure and glycosuria, and he is inclined to regard the tumor found in the adrenal as the direct primary cause for them all. The excessive functioning of the adrenal entailed by the tumor growth—which consisted of chromaffine elements—flooded the organism with epinephrin and this rendered the heart, etc., so unstable that it was unable to resist even the slight shock of a minor operation. Conditions are similar to those in the thymicolymphatic habitus in which sudden death is liable to occur from slight causes. It does not seem possible at present to detect this over-production of epinephrin and the consequent reduction of the resisting powers under its influence, but the discovery of these tumors in the adrenals throws light on certain puzzling cases of sudden death.

116. **Endemic Goiter not Due to the Drinking Water.**—This communication from the hygiene institute at Zurich embraces the results of examination of conditions in regard to the drinking water in fourteen different localities with over 5,600 examinations of individuals residing there. In some of the places the entire population was personally examined. In one town with a population of 693, 61.6 per cent. were found to have goiter; in one with 60, 77 per cent. were affected; one with 195 had 67.7 per cent. The proportion ranged in six towns from 40 to 77 per cent.; in three from 24 to 35 per cent.; in four from 1 to 12.1 per cent. No special geologic formation could be found in these endemic foci, and the drinking water cannot be incriminated as the cause for the goiter, as the distribution of goiter did not correspond to any special type of geologic formation. The endemic foci where goiter had been supposed to have been exterminated by utilizing water from another source, bringing it from a distance, have not shown any diminution of the incidence of goiter as the years pass. The investigators encountered numerous families in which nearly every member had goiter and other neighboring families in which all were free from it. They add that Bircher's statements as to the source of the water supply in certain localities were based on mistaken premises. Renewed investigation showed a different geologic formation than he had supposed.

Goiter is not known to occur spontaneously in rats at Zurich, but the investigators were able to induce it at will by taking the rats to the endemic foci, whether the animals were given the natural water to drink or the water was boiled for them, or they were not given any water or only water brought for them from Zurich. The research carried on with the rats at eight different endemic foci gave positive results in from 40 to 70 per cent. of all the experiments. The nature and origin of the water given the rats to drink had no influence on the outcome. Rats kept at Zurich and given water brought from endemic foci at first did not develop goiter but later there were a few instances of its occurrence; contact infection could not be excluded in these cases. In the endemic foci the animals developed the goiter even when they were given only water from non-goitrous regions.

119. **Addison's Disease and Pregnancy.**—Vogt comments on the far greater prevalence of Addison's disease in men than in women, and states that there is no case known of a woman with primary Addison's disease becoming pregnant and only two instances of pregnancy in secondary Addison's disease. One was reported by Barlow: a woman of 42 who had gummatous tumors in the adrenals and secondary Addison's disease bore a dead child. The other case was reported by Jacquet; pregnancy seemed normal and terminated in the birth of a viable child. After the childbirth the symptoms of Addison's disease improved to a notable extent. Vogt adds a third case to the list and in this case also the pregnancy ran a normal course and a viable child was born somewhat prematurely but the mother died suddenly the eleventh day after a brief period of vomiting and collapse. The adrenals were the seat of tuberculous processes and there was a process in one lung. In 43 per cent. of all cases of Addison's disease, according to the records, the adrenal process is accompanied by tuberculous processes elsewhere; isolated tuberculous processes in the adrenals are known in only 17 per cent. In Vogt's case there was hypoplasia of various organs and the thymicolymphatic status. The aorta was particularly narrow, the heart small, the thyroid enlarged, the thymus persisting. Vogt adds that even when there is no sign of Addison's disease simple overexertion may completely exhaust the epinephrin secretion and lead to sudden death. Comenati and Karl have reported cases of this kind in boys who died in tetanus and the adrenals were found entirely empty of epinephrin, the excessive muscular action in the tetanus having evidently exhausted the supply. At the necropsy of a young man who had died suddenly after a strenuous bicycle race, the total

absence of epinephrin from the adrenals was the only pathologic finding Schmorl could discover. He and others ascribed this fatality to the acute exhaustion of the chromaffine system by the excessive demands on the heart and muscles during the race. If the delivery in Vogt's case had been difficult, the woman would probably have died then, but as it was exceptionally easy, the end did not come until the second week. The prospects for the child are not bad; in this case the child has developed normally.

120. **Danger of Combining Morphin with General Anesthesia.**—Straub recalls a case in which a surgeon started to amputate the finger of a child under morphin alone but found it necessary to give chloroform, and the child died from arrest of the respiration. Experimental research has confirmed the assumption suggested by this case that the injurious action of morphin on the respiration center may be intensified to a dangerous extent by an anesthetic, like chloroform, which acts likewise on the respiration center. Ether has the opposite effect on the respiration center, stimulating it to increased functioning. He gives tracings of the respiration in animals as it was retarded under morphin and still more under ethyl carbamate. Other tracings show that the retarded respiration under morphin can be brought back approximately to normal by atropin. The research reported suggests that when morphin is given chloroform had better be avoided and ether used for the general anesthetic, and, further, that it is best to refrain from any combination with morphin for children as they are more susceptible to morphin than adults. The research further indicates that artificial respiration is illogical and useless when the respiration center is paralyzed.

121. **Death after Auro-Potassium Cyanid.**—This drug has been stated to be free from toxic action but Hauck reports the death of a man of 37 after a systematic course of treatment with it strictly according to directions. The treatment was for extensive lupus which had resisted all other measures, including tuberculin. The cyanid seemed to have a directly destructive action on the blood and severe hemolytic jaundice developed, fatal in less than two months after the treatment had been started.

123. **Seasickness.**—Friedländer thinks that there is a mechanical factor involved in seasickness, namely, the swaying and dragging of the stomach on the esophagus with the pitching of the ship. As an adjuvant to other measures, he warns not to load the stomach, and advises winding a bandage around the stomach to lift it up and thus remove the strain on the esophagus and reduce the swaying of the stomach. His experience with this simple mechanical measure has been very favorable. He urges its use in connection with Fischer's atropin treatment, remarking that Fischer's theoretical explanation of the nervous causes of seasickness seems logical and convincing. (It was summarized in these columns Sept. 6, 1913, p. 814.)

Wiener klinische Wochenschrift, Vienna

August 14, XXVI, No. 33, pp. 1325-1352

124 Serodiagnosis in Psychiatry. (Bedeutung des Abderhaldenschen Dialysierverfahrens für die Psychiatrie und das korrelative Verhältnis der Geschlechtsdrüsen zu anderen Organen mit innerer Sekretion.) M. Urstein.

125 *The Pupil Sign of Vagotony. (Das vagotonische Pupillenphänomen.) R. Somogyi.

126 *Advantages of Rinsing Out the Abdominal Cavity with Ether in Perforation-Peritonitis. F. Dergane.

127 *Acute Syphilitic Polyarthritis in Late Stage of Syphilis. W. Huzar.

128 Patient Should be Informed if He Has Tuberculosis. J. Kollarits.

125. **The Pupil Sign of Vagotony.**—Somogyi writes from Koranyi's clinic to report the findings in 120 patients, including forty-two between 13 and 25, tested for the pupil phenomenon indicating excessive tonicity of the vagus nerve: The pupil dilates during deep inspiration while it contracts during expiration. This pupil sign is accompanied by irregularity of the pulse; it becomes more frequent during inspiration and slows up during expiration. The respiratory arhythmia may occur without the pupil sign but the latter was never observed isolated. Both phenomena are more frequent in younger individuals. A theoretical explanation is offered and the practical importance of this vagotonic pupil sign is emphasized. The phenomenon is the exact reverse of the pupil-dilating action of epinephrin when the tonus of the sympathetic nerve is excessively high. Vagotony is connected with the status thymicolymphaticus and also with many conditions which belong to the group of neuroses. The difficulty of recognizing this status thymicolymphaticus—which predisposes to sudden death on slight causes—renders extremely important any sign which may aid in its discovery. The most striking evidence of the vagotonic origin of this pupil phenomenon is its association with the respiratory arhythmia.

126. **Ether for Rinsing out the Inflamed Peritoneum.**—Dergane has been applying this method which Morestin and others have been advocating in France. Dergane applied it in two severe cases of peritonitis following perforation of a gastric ulcer, or an ulcer in the bowel, from a trauma. The patients were men of 28 and 36, and the operation was done the fifty-fourth or eighty-seventh hour after the perforation. In the gastric ulcer case, after sponging out the fluid found in the abdominal cavity with dry sponges, he poured in 150 gm. of ether. It made a sizzling noise as it found its way into the depths. The ether was then wiped out again at once with dry sponges. All the loops of intestine had taken on a bright red tint. In the second case the intestine was perforated at two points and he washed out the fecal masses, fluids, etc., with an abundance of hot saline, drying the parts with dry sponges afterward. Then he poured in 400 gm. of ether, wiping the parts dry again with dry sponges. Both operations were done under spinal anesthesia, draining through the pouch of Douglas, and the prompt and smooth recovery from the threatening perforation-peritonitis he ascribes to the use of the ether. (Morestin's communication on the subject was summarized in THE JOURNAL June 21, 1913, p. 1971.)

127. **Multiple Arthritis in Late Syphilis.**—Huzar reports three cases of acute multiple arthritis which seemed at first to be ordinary acute articular rheumatism. The knee is generally the joint first involved; with or without some predisposing trauma, the knee swells and becomes painful and then other joints become affected, in turn the elbow and wrist, the finger joints and the sternoclavicular articulation. The temperature may keep within normal range or may run up even to 104 F.; it is generally intermittent. The condition may persist thus for weeks and months; the general condition usually improves or grows worse parallel with the fever, but there is no suppuration in the joints involved. If the syphilitic origin of the affection is recognized in time and specific treatment instituted, conditions soon right themselves and complete restitution follows. If not, the acute phase passes into a chronic stage and various destructive processes develop which it may be impossible to influence with any measures at our command. Huzar remarks that the more we learn about the family history of old syphilitics, the more frequent becomes the discovery of latent syphilis in the mothers, and the oftener we hear of a history of past attacks of "articular rheumatism." It is beyond question that some of these "rheumatism" cases were in fact unrecognized syphilitic joint troubles. In some cases potassium iodid was given for the supposed rheumatism and thus unwittingly proper treatment had been applied. The whole course of the syphilitic polyarthritis is milder than that of acute febrile articular rheumatism, and the endocardium and serous membranes are not affected as with the latter. Nocturnal exacerbations are also characteristic. In any event, the arguments here presented impose the necessity for applying the Wassermann test and starting specific treatment in every case of multiple joint trouble which does not yield promptly to ordinary treatment. The old notion that late syphilitic processes are not accompanied by fever is no longer tenable. He advises treatment with mercury and potassium iodid, with salvarsan in case these fail. The more important German works on the subject are listed.

Zeitschrift für Kinderheilkunde, Berlin

VIII, No. 4, pp. 291-362. Last indexed August 30, p. 722

129 Phagocytic Power of Colostrum Cells. (Zur Biologie des Colostromkörperchen.) E. Thomas.
130 Unsatisfactory Results of the Cutaneous Tuberculin Test in Children. (Zur Frage der cutanen Tuberkulinreaktion bei Kindern.) H. Rozenblat.
131 *Roentgen Diagnosis of Pulmonary Tuberculosis in Children. E. Rach.
132 Salt-Fever Caused by Heat Retention from Lack of Water. (Kann die Theorie dass das Salzfieber durch Wärmestauung verursacht wird, als widerlegt betrachtet werden.) P. Heim.
133 *Roentgenoscopy of the Infant's Stomach. R. Major.
134 *Right-Handedness in Infants. E. Voelckel.
135 Epidemic Poliomyelitis in the Netherlands in 1912. J. C. Schlippers and C. de Lange.

131. **Roentgen Diagnosis of Pulmonary Tuberculosis in Children.**—Rach found two cases showing a three-cornered shadow with its base toward the heart and the apex extending toward the periphery. On autopsy they were found to correspond to caseated foci lying near the hilus. Ghon's primary focus can frequently be demonstrated radiographically when it can be shown by no other method. (Ghon declares that in practically all cases involvement of the lymph-nodes is secondary.) When there are negative physical findings but a positive von Pirquet and a sharply circumscribed shadow lying to the side of the hilus, the diagnosis is positive. The prognosis of this picture is the more favorable, the older the child. After 8 years of age it generally denotes a stationary tuberculosis and offers the most favorable explanation of a positive cutaneous test. Swelling and caseation of the paratracheal glands on the right are frequent, and are shown by a shadow extending outward from the median line running parallel to the trachea for a space and then rejoining the median line. It generally denotes a progressive tuberculosis involving the bronchial lymph-nodes. An interlobar pleuritis was shown in two cases by a sharp linear shadow corresponding to the interlobar fissure.

133. **Roentgenoscopy of the Infant's Stomach.**—As seen by the Roentgen ray the stomach of an infant in a standing position has the shape of an inverted retort; when lying down, that of an irregular sack. The respiratory movements of the diaphragm cause movements similar to peristalsis. The mechanism of emptying the stomach is similar to that in the adult, but there is not such marked peristalsis. Between meals the stomach is generally not contracted, but is distended with air.

134. **Right-Handedness in Infants.**—Voelckel says that the functional difference in the brain hemispheres which causes right-handedness appears first at the age of seven months and increases from that time on. Before that age there is no difference in the use of the two hands.

Zentralblatt für Chirurgie, Leipsic

August 23, XL, No. 34, pp. 1329-1360

136 Technic for Exclusion of the Pylorus. (Pylorusausschaltung.) E. Polya and A. Hoffmann. (Pylorusverengerung und Bildung eines Lig. suspensorium ventriculi durch freie Aponeurosentransplantation.) R. Göbell.

Zentralblatt für Gynäkologie, Leipsic

August 23, XXXVII, No. 34, pp. 1253-1284

137 Fatal Non-Obstetric Laceration of the Vagina. (Zerreissung der Vagina sub coitu mit letalem Ausgang.) R. Köhler.

Zentralblatt für innere Medizin, Leipsic

August 23, XXXIV, No. 34, pp. 857-880

138 Serodiagnosis of Liver Disease. (Ueber die Diagnose der Leberkrankheiten mit Hilfe der Methode von Professor Abderhalden, mit spezieller Berücksichtigung der Selbständigkeit der beiden Leberlappen.) M. J. Breitmann.
139 Serodiagnosis of Pernicious Anemia. (Beziehung der Magen-Darmaffektionen zu der perniziösen Anämie nach dem Dialysierverfahren von Prof. E. Abderhalden.) B. T. Kabanow.

Gazzetta degli Ospedali e delle Cliniche, Milan

August 19, XXXIV, No. 99, pp. 1031-1038

140 The Wassermann Test and Salvarsan in Inherited Syphilis. E. Mensi.

August 21, No. 100, pp. 1039-1046

141 *Torsion of Spermatic Cord. (La necrosi del testicolo per torsione del cordone.) C. Viscontini.

141. **Torsion of Spermatic Cord.**—Viscontini's patient was an 8-months infant and the spermatic cord had twisted thrice around. The child was apparently healthy and thriving when it began suddenly to scream and twist, keeping this up constantly for hours; then it vomited and the mother noticed that the scrotum was swollen and hard. An operation was done on the assumption of an incarcerated hernia but the trouble proved to be torsion of the spermatic cord and the testicle was found in a state of total gangrene. The torsion evidently occurred as the testicle was descending, and this is the fourth case of the kind on record according to accessible literature. The presumptive diagnosis of incarcerated hernia in such cases leads to waste of time in trying to reduce the supposed hernia and, still worse, the maneuvers for correction and reduction injure still further the already suffering cord and testicle.

Policlinico, Rome

August 17, XX, No. 33, pp. 1177-1212

142 *Exclusion of the Pylorus. (La piloropessia intra-parieto-muscolare quale nuova metodo di esclusione pilorica nella gastroptosi con gastroectasia.) C. Mariani.
143 Intellectual Overwork. (Alcune considerazioni sullo strapazzo mentale.) E. Pietro.
144 Indicanuria in Its Relation to the Pancreatic Juice. (L'indicanuria in rapporto alla secrezione esterna del pancreas.) V. Puglione.
145 Treatment of Lack of Appetite. P. Alessandrini.

August 24, No. 34, pp. 1213-1248

146 Pellagra in the Rome Province. G. Alessandrini, A. Giannelli and E. Fileni.

142. **Exclusion of the Pylorus with Gastro-Enterostomy.**—Mariani has applied in a case of gastroptosis and dilatation of the stomach, requiring gastro-enterostomy, a method of exclusion and fixation of the pylorus which, he says, has many points to recommend it. The stretched pylorus was kinked on itself and was sutured to the duodenum and below to the rectus muscle and subcutaneous tissue, thus not only closing it up completely and permanently but supplying a firm support for the sagging stomach. The functional results were ideal at once, but the patient succumbed during the second week to ether pneumonia. The conditions found at the site of the operation confirmed the advantages of this technic when the stomach and pylorus are stretched enough to permit it.

Medizinskoe Obosrienie, Moscow

LXXIX, No. 9, pp. 733-814

147 Differential Diagnosis of Paranephritic Abscess. B. Shtomitch.
148 *Incision for Calculi in Kidney Proper versus Incision in Kidney Pelvis. (K voprosu o nephro- i pyelolithotomy.) D. P. Shenker.
149 *Fat Implant to Fill Cavity in Tibia. (Slutchai peresadki zhira v. kostnuiu polost. V. A. Perimov.
150 Influence of Meteorologic Factors on Course of Pneumonic Plague in Manchuria, 1910-1911. P. Pawlow.
151 Agglutinins. (Obzor sovremennago sostoyania voprosa o phytohaemagglutinin'ax.) I. L. Vakulenko.

148. **Pyelolithotomy versus Nephrolithotomy.** — Shenker reports seventeen cases of operative treatment of kidney calculi and calls attention to the better results when the kidney pelvis is opened instead of the kidney proper. The patients recover in half the time or less with pyelolithotomy instead of nephrotomy, and the operation is much less of a strain on the system.

149. **Fat Implant to Fill Cavity in Bone.**—Perimov's patient was a girl of 16 with osteomyelitis of the tibia of four years' standing. It had been operated on fifteen months before but a fistula had persisted after the curetting. Perimov enlarged the fistula, scraped out the surface of the large cavity found in the bone and after drying it with sponges, buried in the cavity a strip of adipose tissue 7 cm. long by 4 cm. wide, taken for the purpose from the subcutaneous tissue of the abdomen. On account of the pathologic condition of the skin at the site of the bone focus there was some difficulty in suturing the wound, and the lips parted under the dressings so that the fat implant could be seen when the dressings were changed the seventh day. It had not changed in aspect at all. The outer surface was then scraped away and the defect in the skin closed by two skin flaps from each side. There was no bleeding from the fat graft as it was curetted.

Perimov does not venture to decide the question whether the graft is acting as a foreign body, merely plugging up the cavity, or whether it is being vitalized in the depths. Be this as it may, he remarks, the important fact is that the girl was completely cured of her old bone affection by the end of two months.

Brazil-Medico, Rio de Janeiro

July 22, XXVII, No. 28, pp. 283-296

152 *Prophylaxis of Venereal Disease. A. Porto.
153 Prophylaxis of Leprosy. E. Gomes and F. Terra.

August 8, No. 30, pp. 305-320

154 Transmission of Trypanosome by Brazilian Insect. (Da transmissão do trypanosoma Cruzi pela Triatoma sordida Stal.) A. Neiva.
155 *Prophylaxis of Venereal Disease. W. Machado.

152-155. **Sanitary Control of Prostitution.**—A. Porto here makes an able plea for the introduction into Brazil of the method of registering prostitutes and keeping them under sanitary control as the wisest method at the disposal of the world at present for the prophylaxis of venereal disease. He discusses the subject under the four heads of individual, moral and public prophylaxis and treatment. By individual prophylaxis he means the intensive and extensive dissemination of all the medical knowledge in regard to syphilis, its contagion, transmission and its disastrous effects. He says that all the leagues and preventive organizations that have been founded have accomplished little or nothing to date. The mother organization, founded at Brussels by Dubois-Havenith, recently went out of existence, and attempts in Brazil to found a similar organization came to nothing on account of the general indifference. By public prophylaxis he means well managed sanitary control of prostitutes, and he takes up in turn the ten most widely urged objections against this system and answers them. As society is now constituted, he says, prostitution has little chance of total eradication at present, and the only thing to do is to reduce its evils as much as possible. The discovery of salvarsan is a new and powerful argument for sanitary control, as under the influence of prompt salvarsan treatment the external lesions heal over with surprising rapidity, which materially lessens the danger of infecting others.

The old objection that the patrons would be lulled into a false security by the certificate of health given the prostitute at the medical inspection, when she may have become infected immediately afterward, he answers by two statements, (1) that the primary sore is generally painful so that contact is usually avoided during this stage and under sanitary control the disease would be discovered before this stage had passed into the non-sensitive and more acutely contagious phases; (2) the certificate might specifically state "Without guarantee," just as certain French patented articles bear the stamp "Brevêté, S. G. D. G." (patented, without government guarantee). The objection that sanitary control is infringing on the personal liberty of the women he answers by saying that women practicing prostitution are breaking the laws and undermining the bulwarks of the state by sapping at the foundations of the Family, and hence they have no right to complain of any infringing on their personal liberty.

To the objection that those who deal with prostitutes know the perils to which they are exposing themselves, he answers that no one but a physician can appreciate those perils at their true value. Those who have nothing to do with prostitutes and who say "Let each man assume the responsibility for his adventures," even these are not sure that syphilis may not be brought into their families by some servant or relative. In short, he concludes, it is the duty of the state to keep prostitutes and pseudo-clandestine prostitutes and peri-prostitutes under sanitary control, but the measures should be applied very liberally and wisely, and the abuses of the system that have been noted in other countries must be kept out at every cost. He says it will be easier to introduce a model system where nothing of the kind has ever been known than it has proved in European countries where it was a question of remodeling old systems.

Machado states that until quite recently he was opposed to sanitary control, and in fact the Academia Nacional de Medicina in 1902 voted against the introduction of any such system. But he has been converted to the necessity for it, and cites statistics from various countries showing the urgent need for it and the comparatively good results from it in France where it is systematically applied. Sanitary control was abolished in Denmark in 1906, and he quotes statistics to show that the number of cases of venereal disease in Copenhagen has increased materially since then, according to the records of physicians: from 6,666 in 1905; 7,065 in 1906, to 10,249 in 1908, while the number of cases of syphilis in 1905 was 1,277 and in 1908, 2,484. To allow prostitutes to ply their trade without sanitary control wisely applied, he declares is a crime of high treason against the prophylaxis of disease (*crime de lesa-prophylaxia*).

Hospitalstidende, Copenhagen

August 20, LVI, No. 34, pp. 981-1004

156 Serodiagnosis of Syphilis. (Fortsatte Undersøgelser over Herman-Perutz' Reaktion Specificitetsundersøgelser.) V. F. Møller. Commenced in No. 33.

Hygiea, Stockholm

June, LXXV, No. 6, pp. 513-624

157 *Epidemic of Diarrhea. (En diarré-epidemi vid K. Västerbottens regemente 1910.) O. Anders on.
158 *Differentiation of Phlegmonous Angina and Diphtheria. (110 fall af peritonsillit och några reflexioner med anledning däraf.) G. Chartier.

July, No. 7, pp. 625-720

159 Early History of Obstetrics in Sweden. (Om obstetrikens ställning i Sverige vid slutet af 1600-talet samt Johan von Hoorns betydelse for dess utveckling.) F. Westermark.
160 Plastic Operation on the Nose. (Fall af näsplastik.) A. Troell.

157. **Epidemic of Diarrhea.**—Andersson devotes eighty-four pages to the report of an epidemic affecting 472 of 1,235 soldiers during some maneuvers in 1910. The symptoms ranged from those of ordinary enteritis to a syndrome resembling typhoid; in some cases gastric symptoms predominated. The first case dated from Sept. 4 and the others strung along to Sept. 26. The symptoms differed from those of paratyphoid as also from proteus and colon bacillus infection and botulism. He gives a detailed study of the whole epidemic with eighteen tables under various headings. His final conclusion is that the epidemic was due to meat poisoning, although the long period during which the cases developed and the fact that a few of the sick had not eaten any meat are hard to reconcile with this conception.

158. **Differentiation of Phlegmonous Angina and Diphtheria.**—Charlier reviews his experience with 110 cases of the former and emphasizes the danger of mistaking true diphtheria for ordinary tonsillitis or quinsy and incising. In five cases in which this was done the patients died and in a sixth case, although the patient recovered, yet he was long in grave danger. A history of preceding attacks of peritonsillitis is a great aid in differentiation; also the age, as diphtheria affects mostly children while 83 per cent. of the peritonsillitis patients were between 16 and 39; 9 per cent. over 40, and the other 9 per cent. were between 9 and 15. Another aid in differentiation is absence of known contact with diphtheria. Tenderness of the swollen part of the throat occurs early with peritonsillitis, but Charlier has never known of this with diphtheria. There was no hoarseness in ninety-four of the 110 cases, and there was not the peculiar odor of the breath common in diphtheria. On account of the great tendency to recurrence of peritonsillitis it seems wise to operate on the tonsils in such cases. Sörensen says in regard to the danger of incision in a case of diphtheria which has been mistaken for phlegmonous angina that it is not the incision which renders the prognosis so grave in such cases but the fact that when diphtheria commences with a phlegmonous lesion it is of an exceptionally severe type. In any event, Charlier advises to be wary of using the knife for a supposed phlegmonous angina until certain of its non-diphtheric character.